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A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. LXVI: No. 2. *New York, Thursday, July 12, 1900.* $5.00 a Year, including Postage. Single Copies, Ten Cents.

Reading Matter Contents.....page 52
Alphabetical Index to Advertisers " 135
Classified List of Advertisers..... " 137
Advertising and Subscription Rates " 59

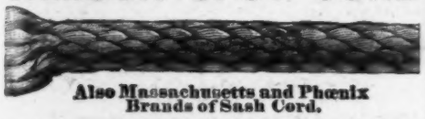


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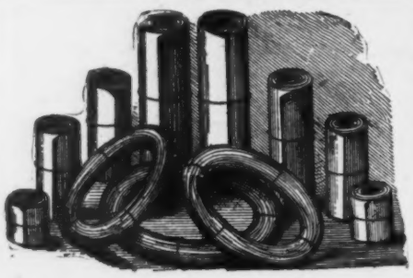
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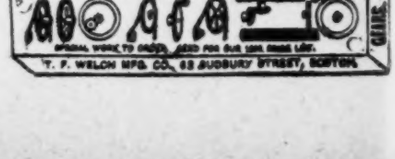
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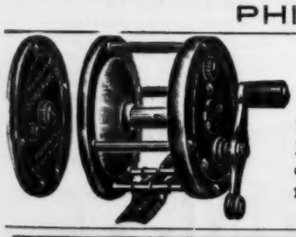
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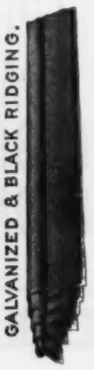


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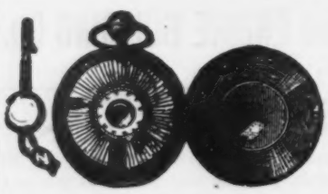


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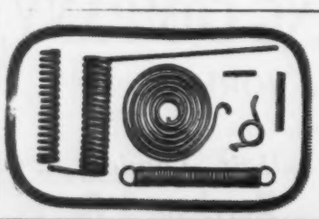


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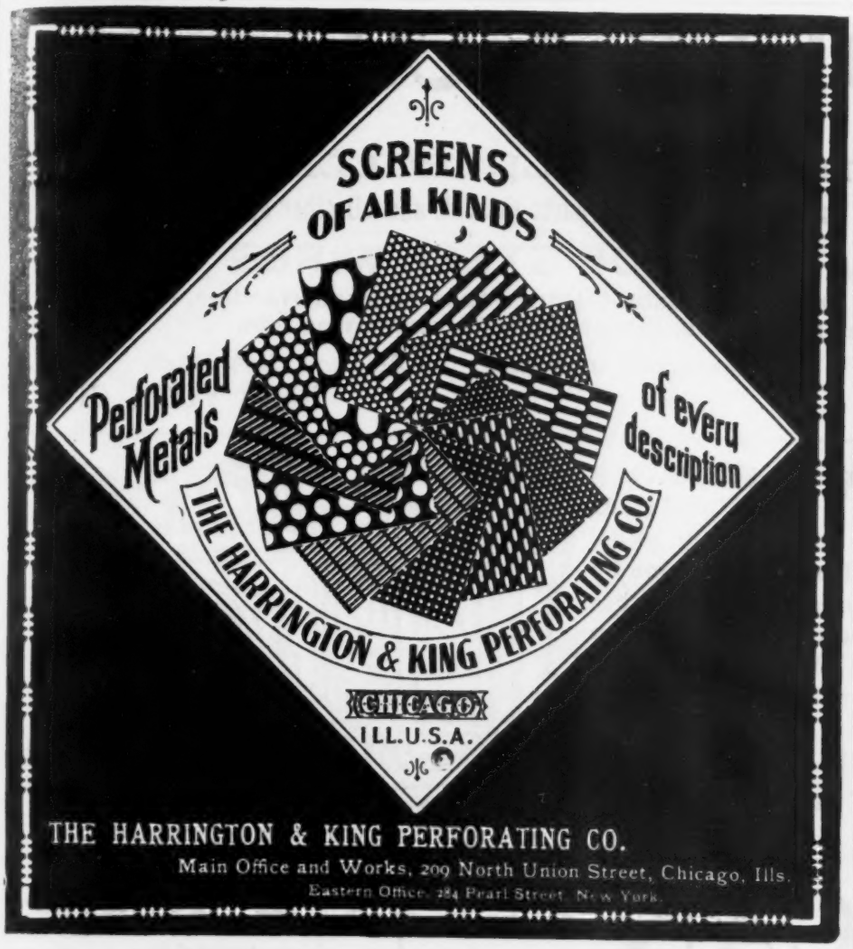
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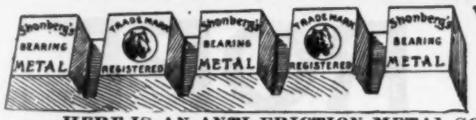


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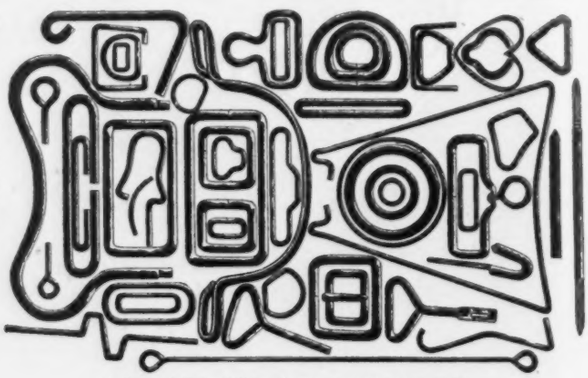
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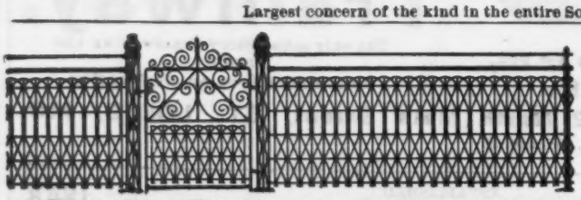
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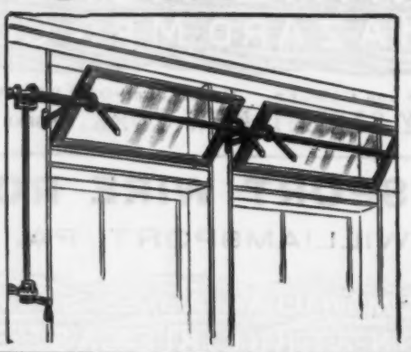
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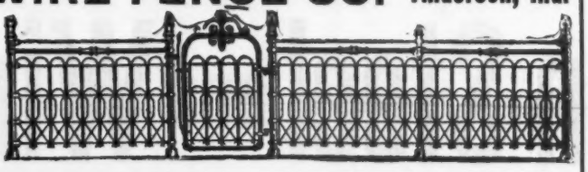
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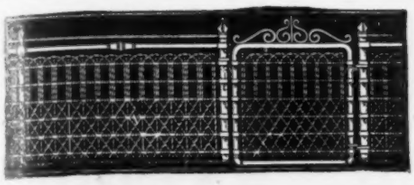
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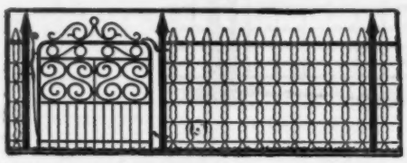
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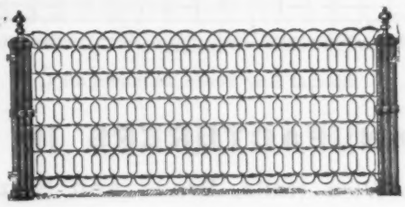


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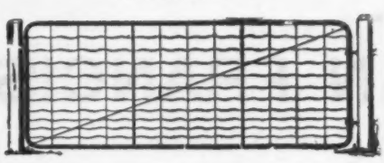


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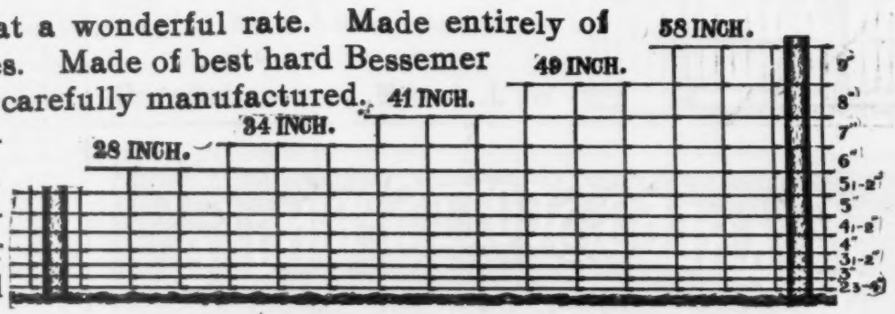
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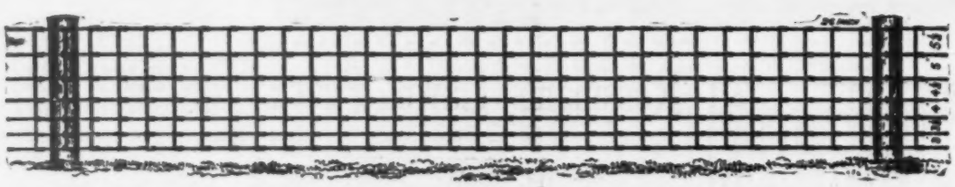
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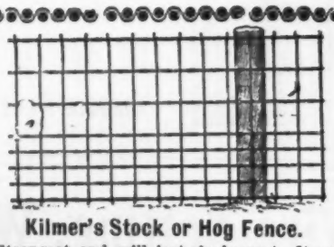
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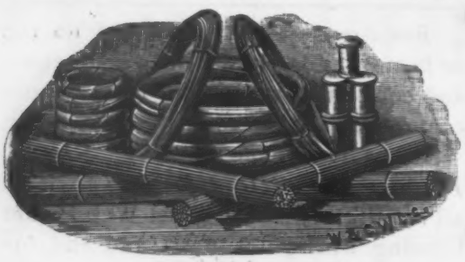
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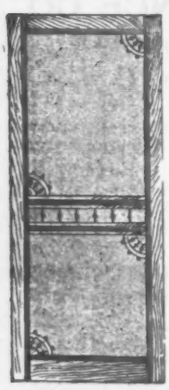


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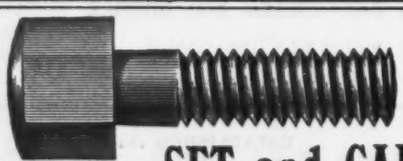
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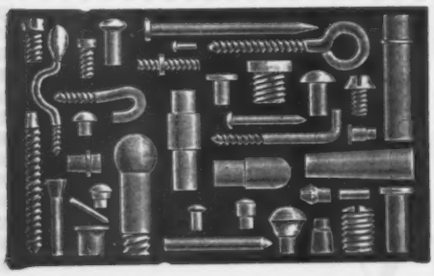
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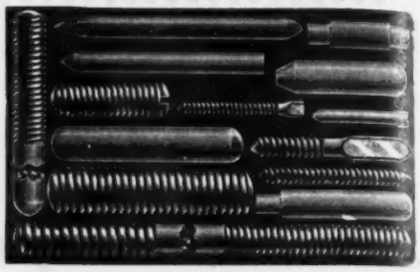
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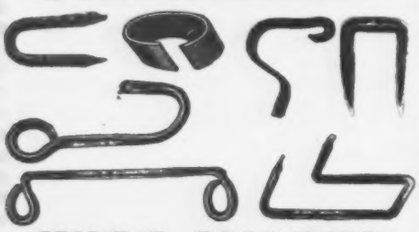
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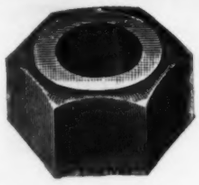
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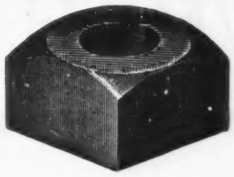
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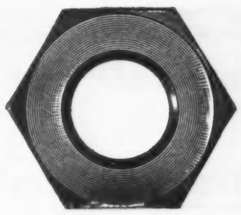


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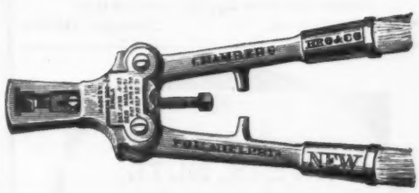
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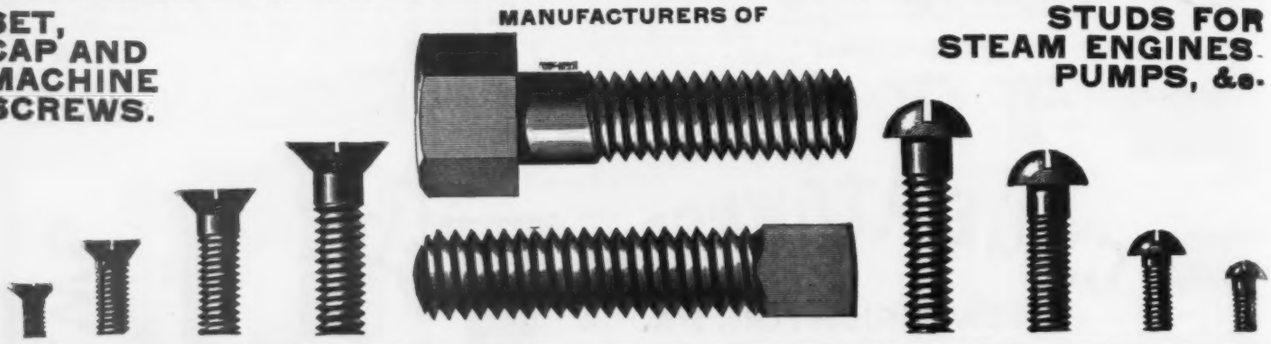
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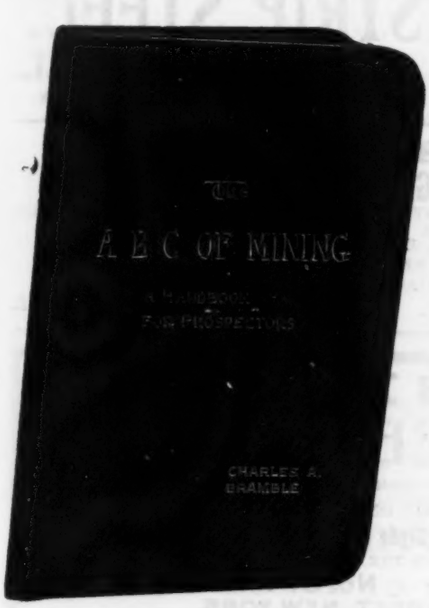
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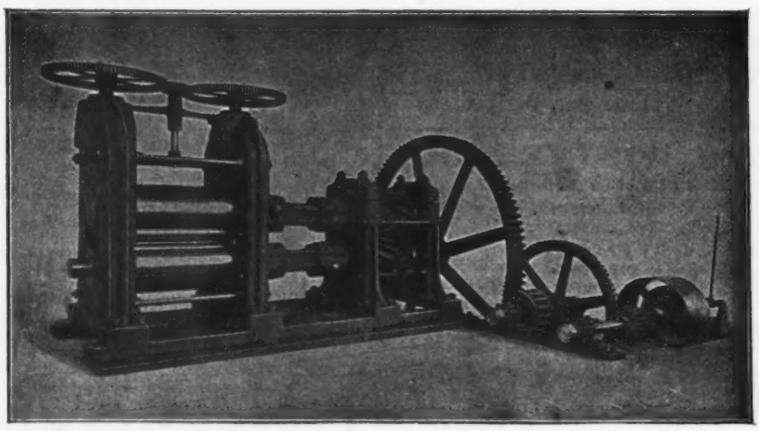
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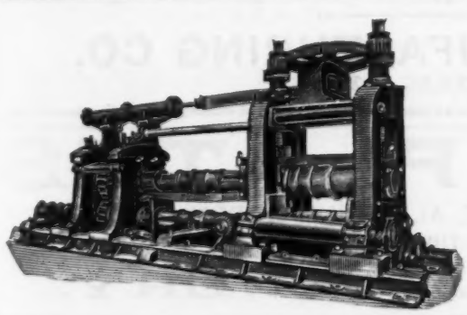
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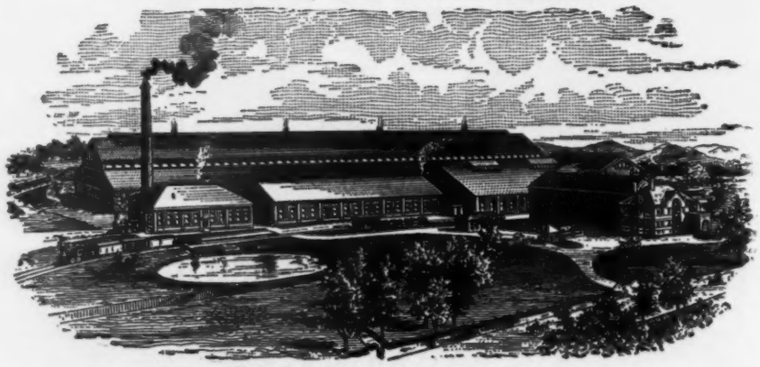
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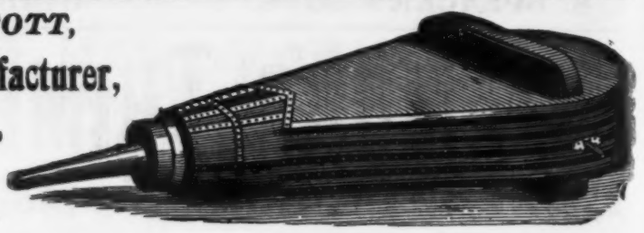
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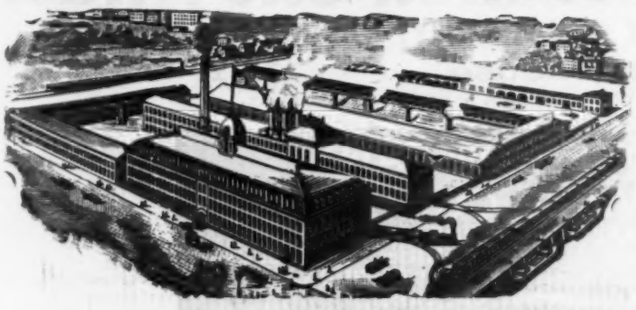
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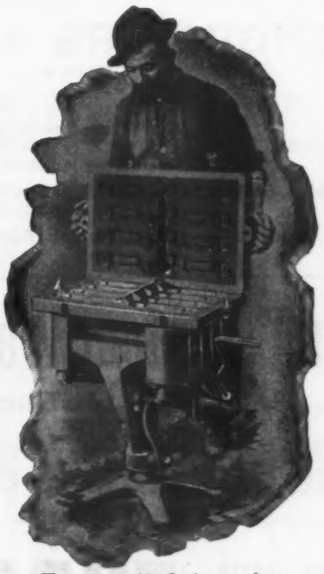
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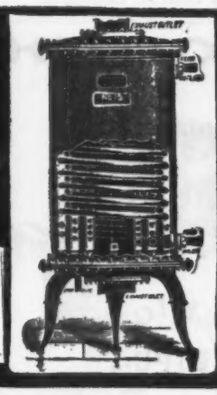
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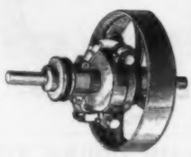
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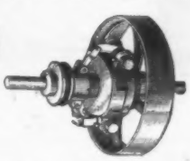
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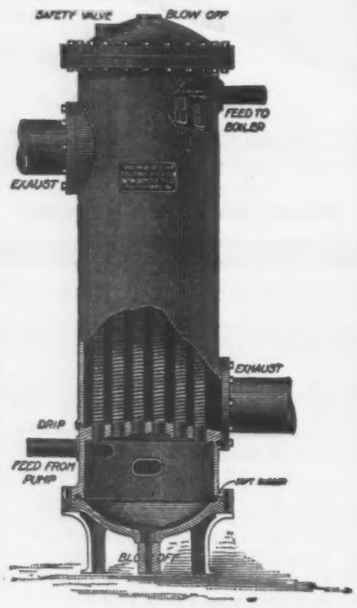
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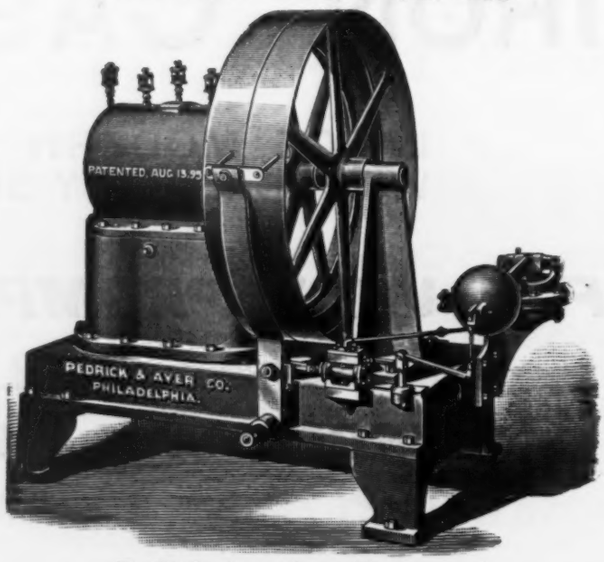


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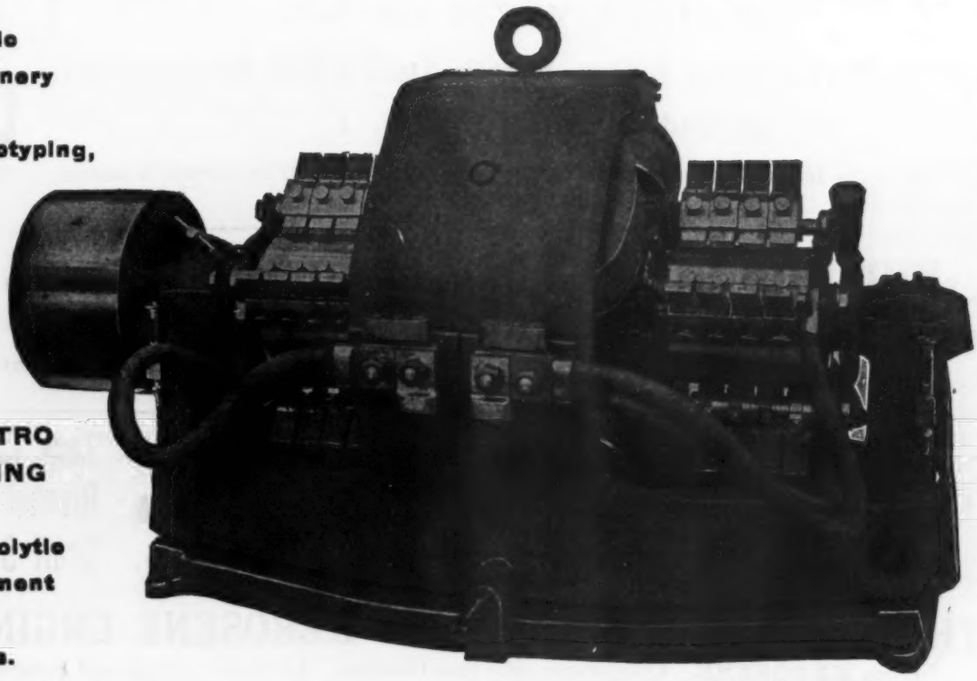
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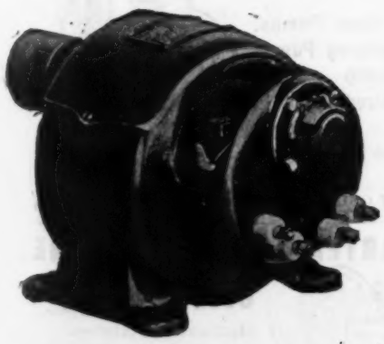
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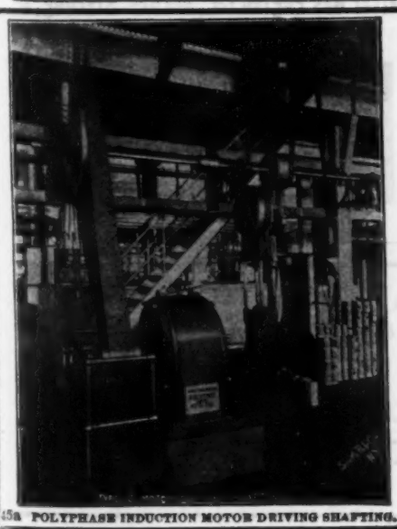
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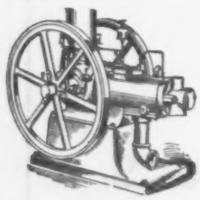
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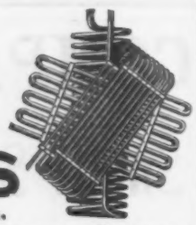
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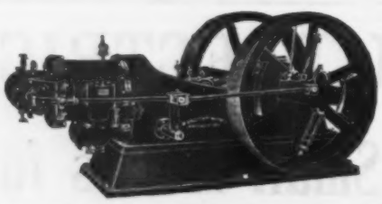
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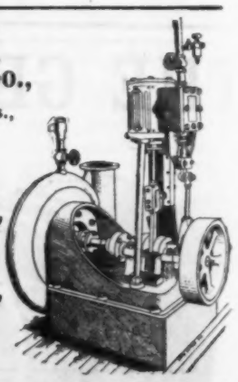
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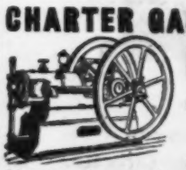
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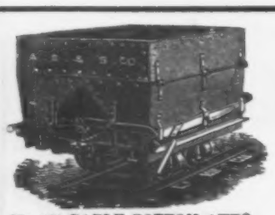
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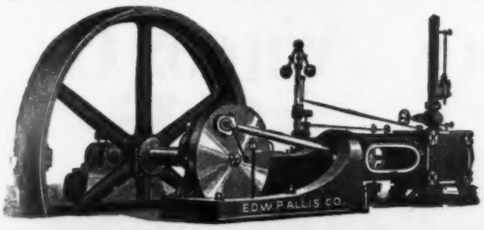
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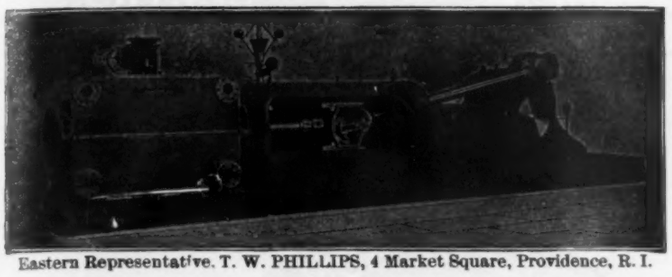


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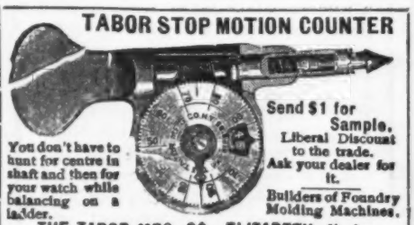
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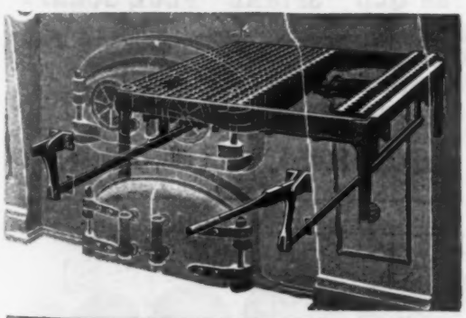


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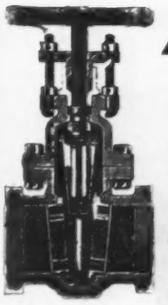
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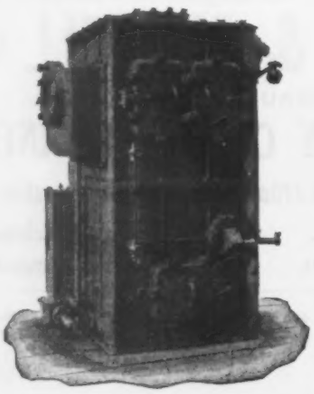


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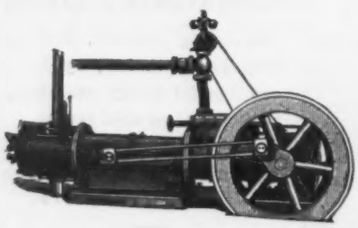
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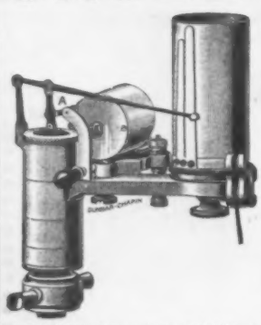
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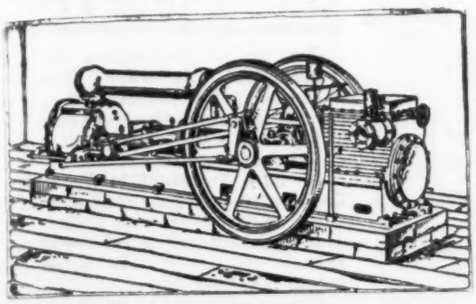
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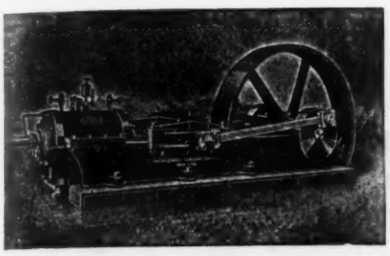
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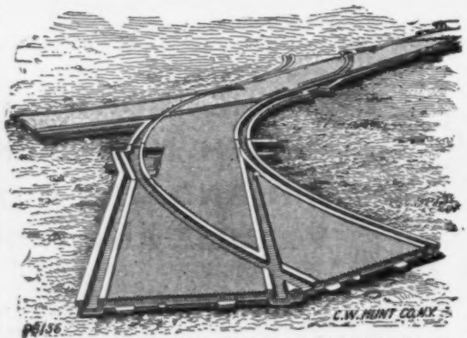
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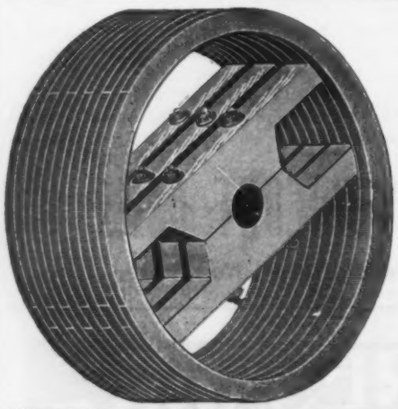
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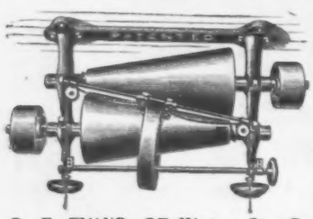
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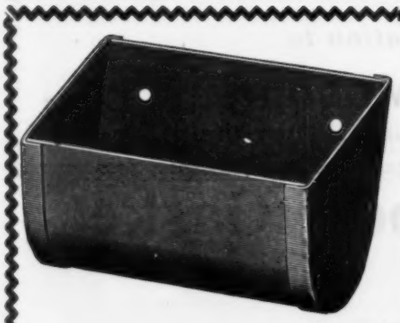
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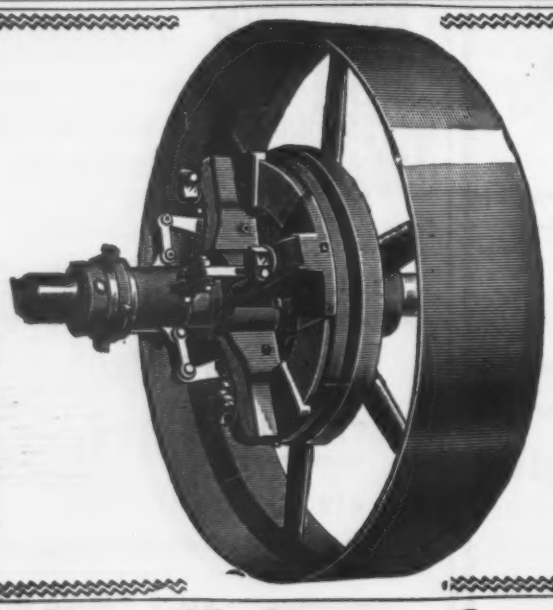
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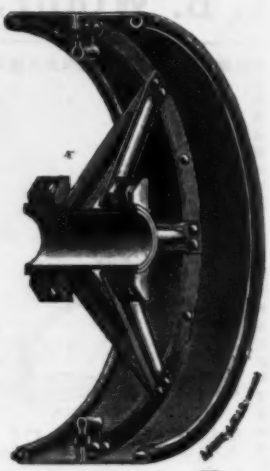
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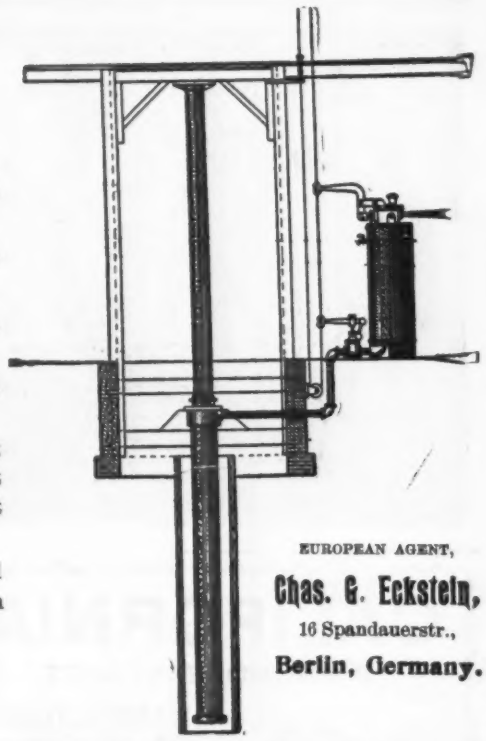
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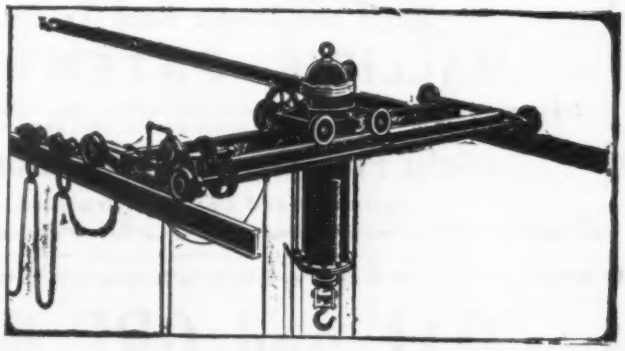


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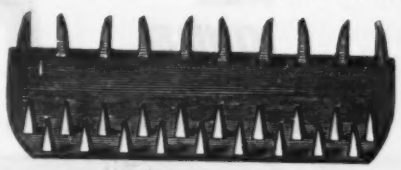


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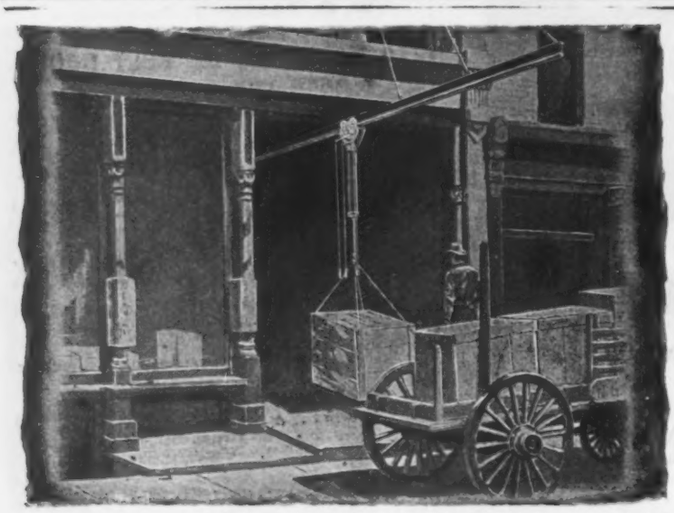
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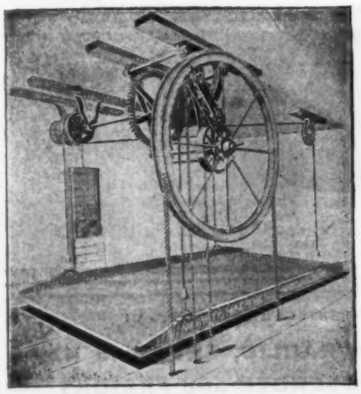
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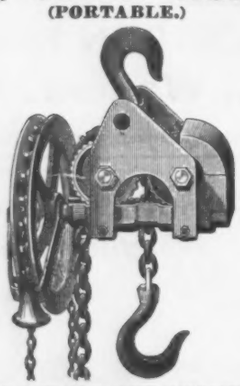
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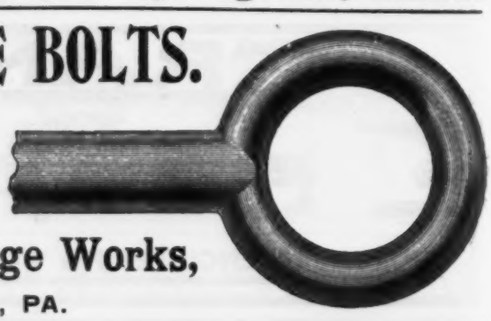
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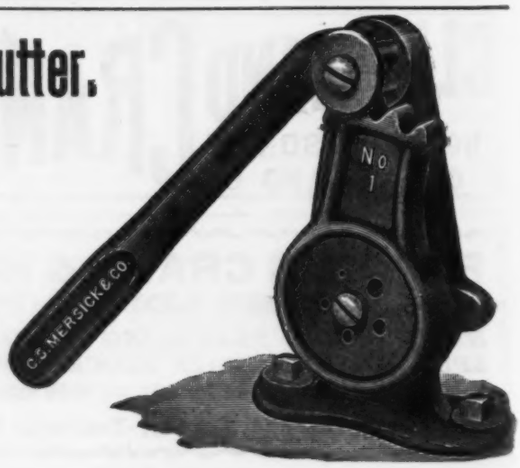


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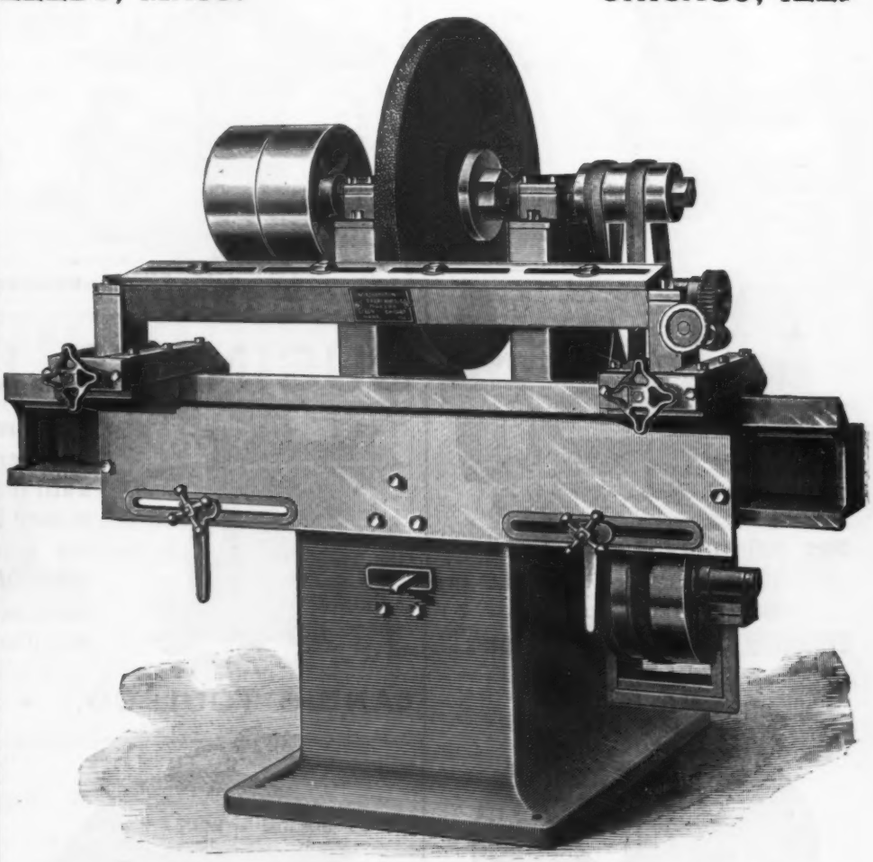
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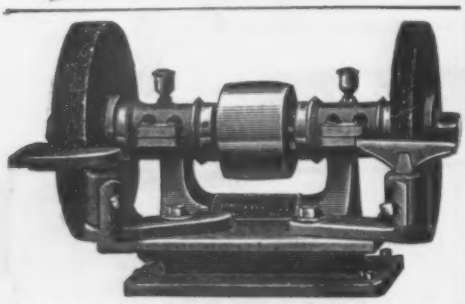
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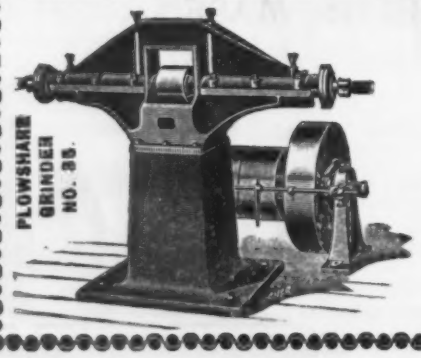


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Manufactured by
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HIGH GRADE
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are more carefully made and graded better than other emery wheels. They will do finer work and more of it; and they are far safer to use. These are a few of their good points. There are others. Our catalogue tells about them. Send for it.



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The results obtained by the use of the **American Twist Drill Grinder** are far superior to those of any other machine, because our machine is simple, accurate, quick and durable.

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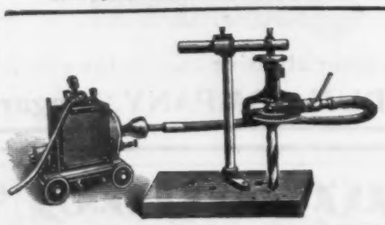
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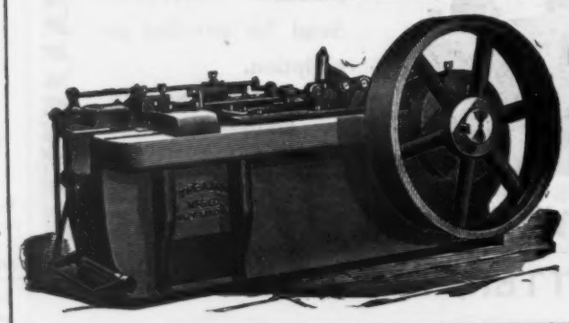
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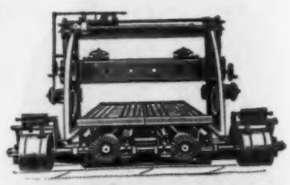
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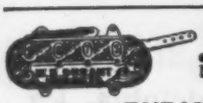
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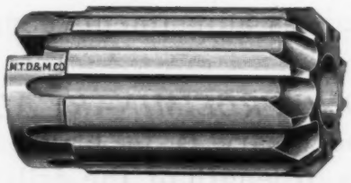
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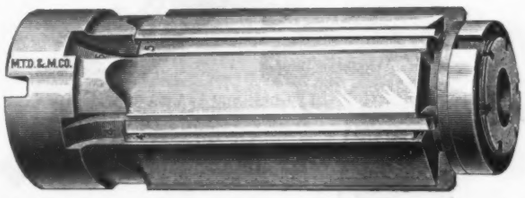
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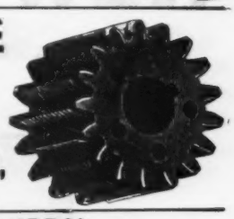
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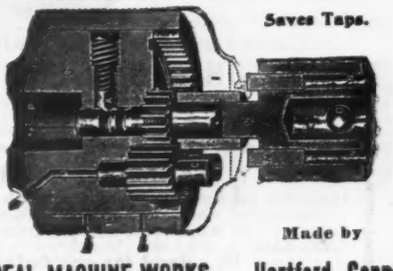
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NEEDS NO PATENTED GAUGE JAWS.

All such needless adjustments done away with.

The *ONLY ONE PRELIMINARY ADJUSTMENT* necessary is to bring up tail stock to suit length of the drill.

WE GUARANTEE

That the drill can be manipulated with greater ease.
Can be ground in a fraction of the time.
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Enables the drill to do better and faster work than on any other machine made.
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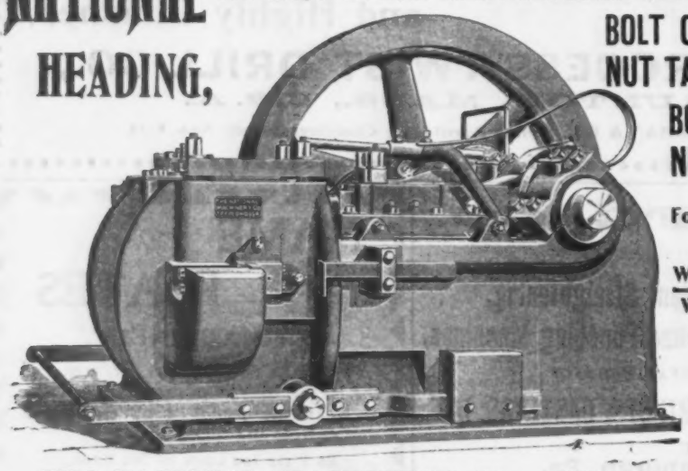
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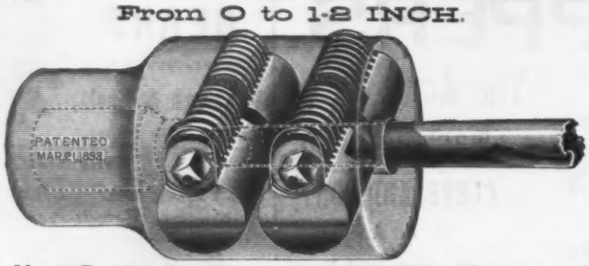
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From 0 to 1-2 INCH.



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TWO DRILLS,

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We manufacture Ten distinct styles of Lathe Chucks. Four styles of Drill Chucks, Centering Chucks, Face Plate Jaws and Chucks for special service. Send for new catalogue and discount sheet.

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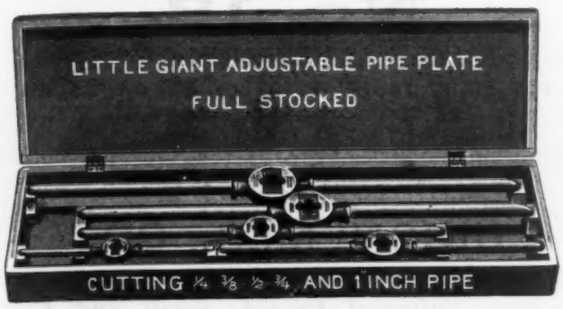
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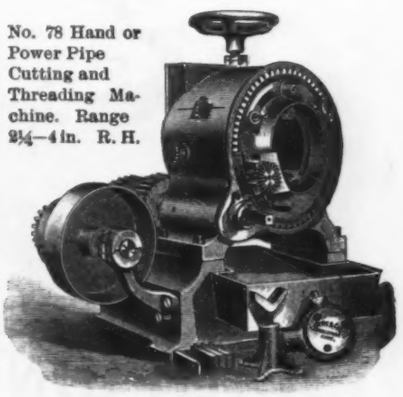
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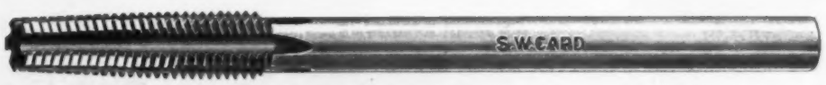


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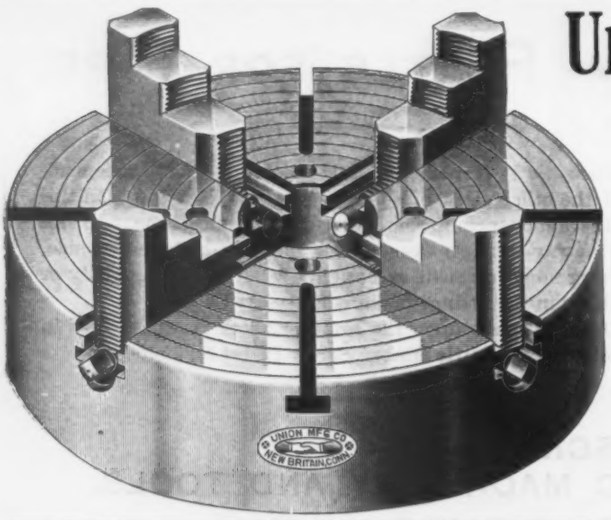
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Union Independent Chuck,

No. 18.

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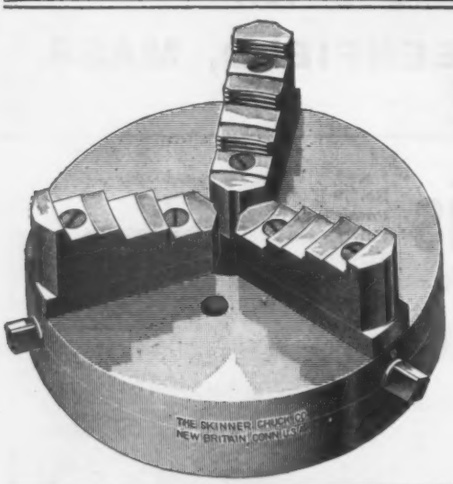
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A well made chuck of great strength, "T" slot commencing with 10 in. size and up.

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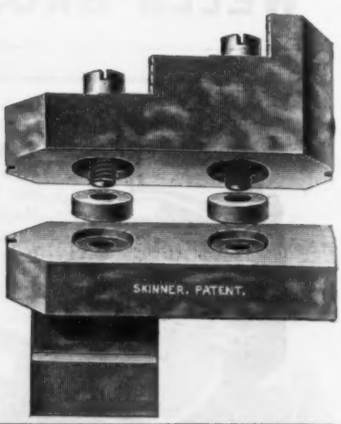


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With Patent Reversible Jaws.

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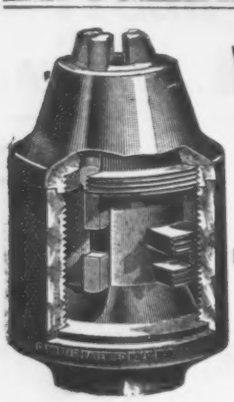


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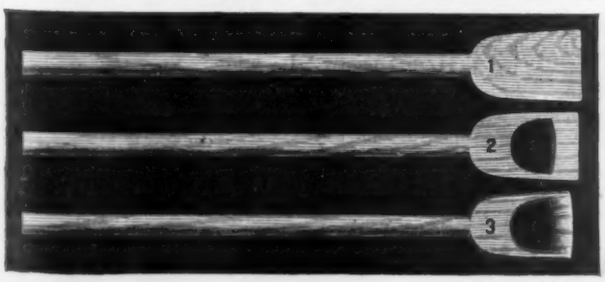
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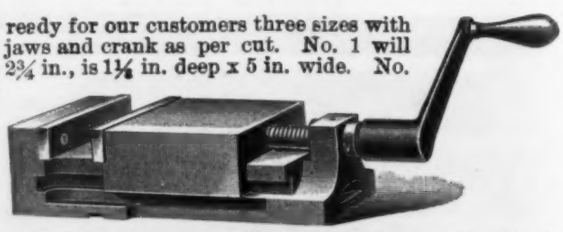
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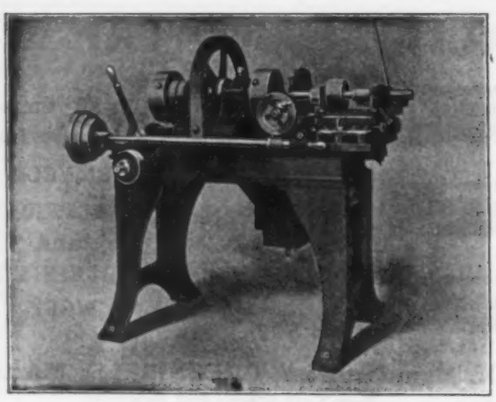
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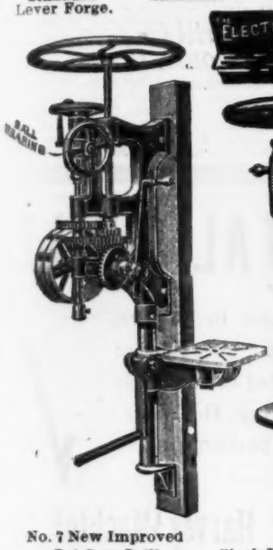

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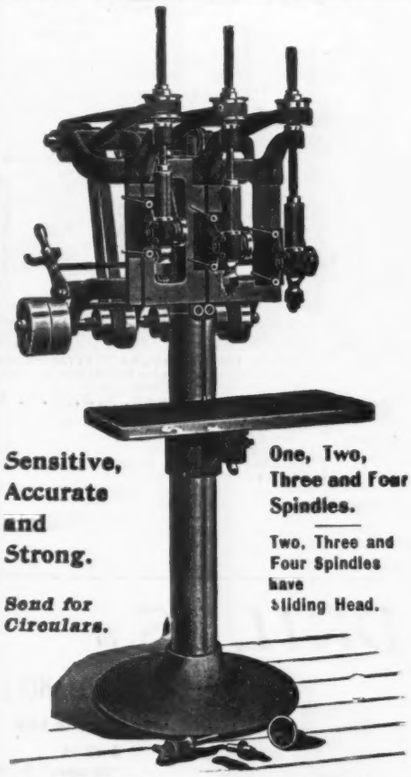
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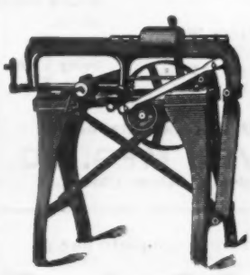
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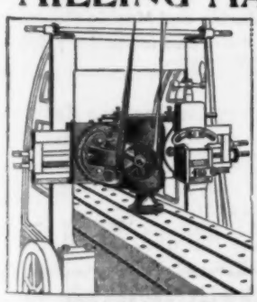
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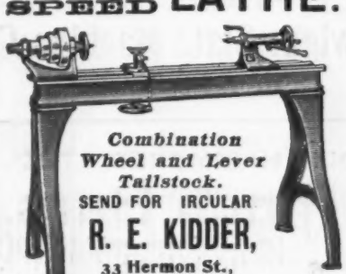
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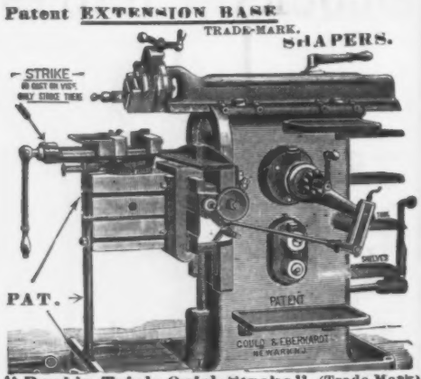
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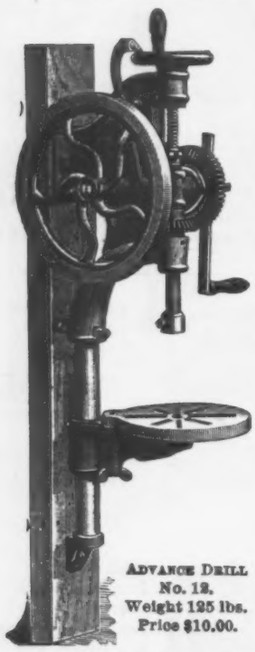


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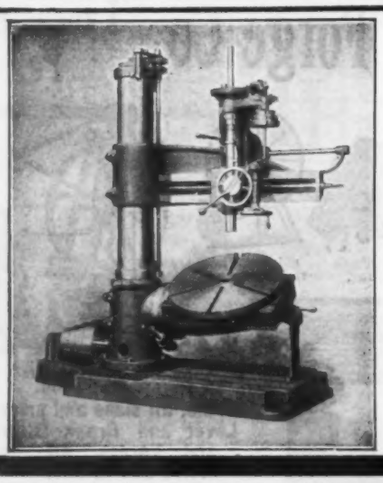
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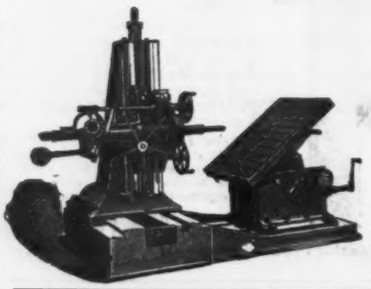
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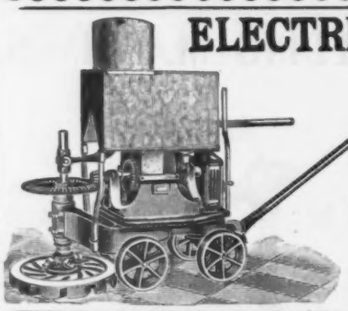
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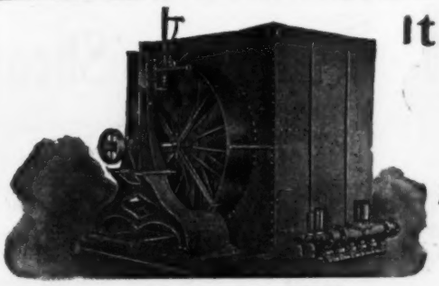
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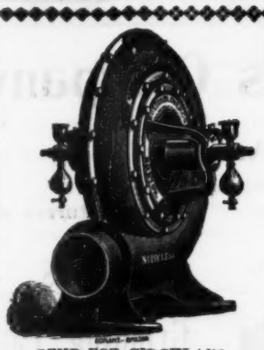
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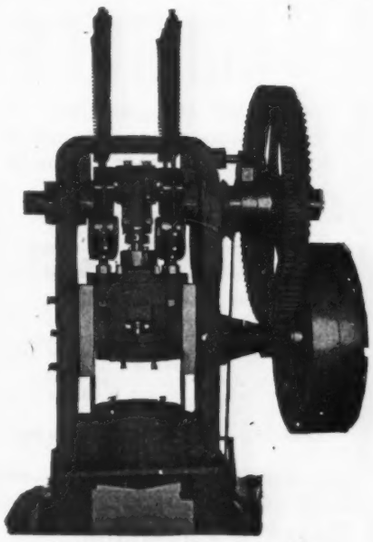
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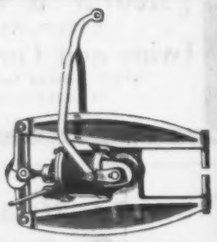
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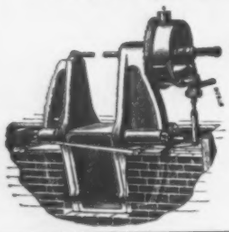


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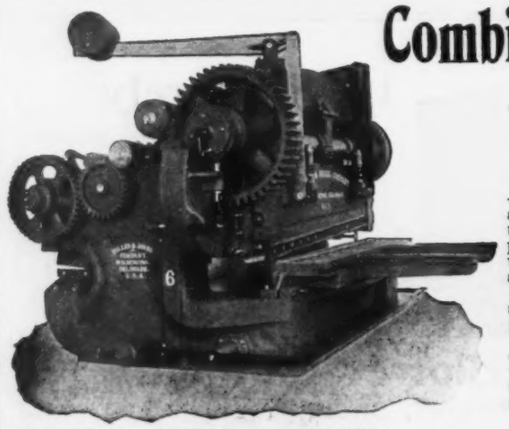


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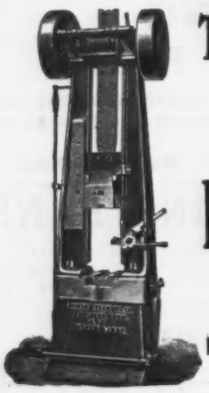
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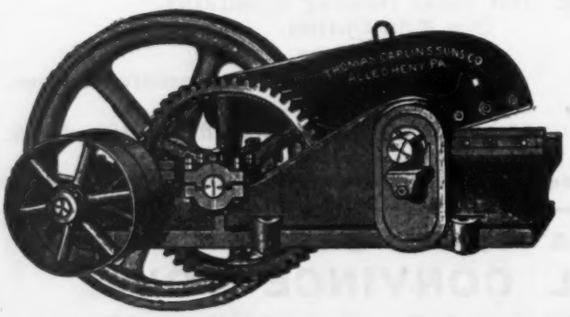
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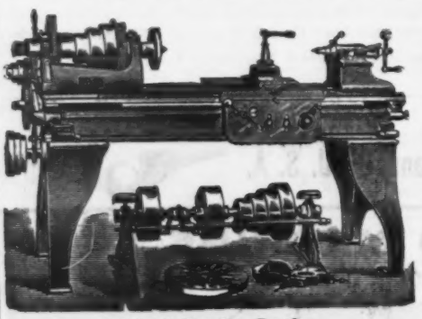


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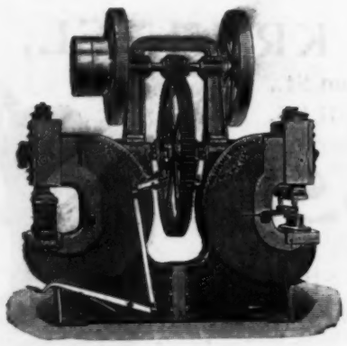


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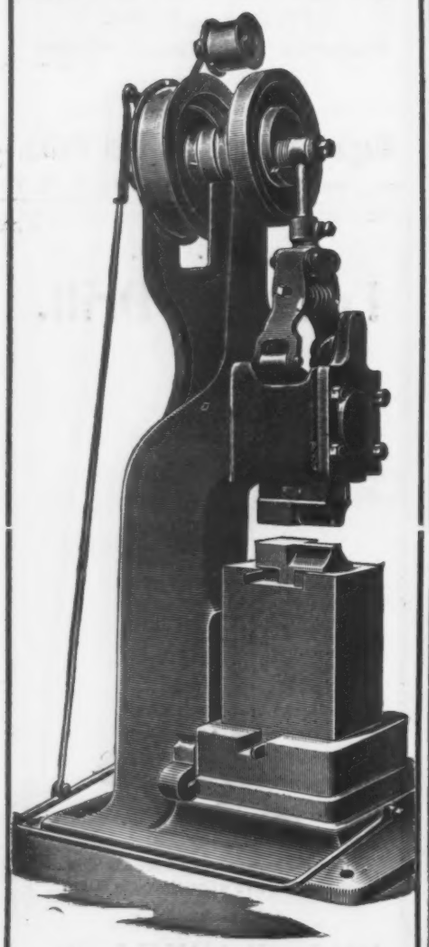


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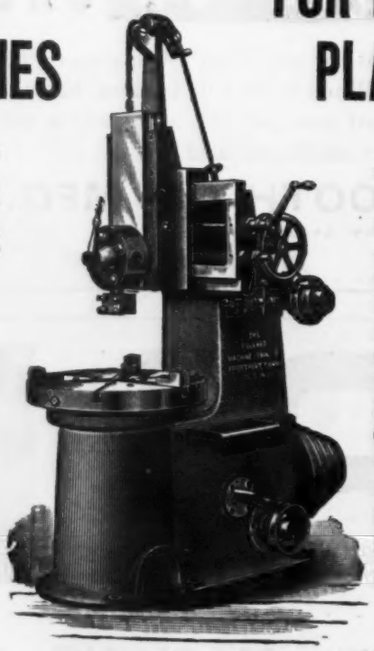
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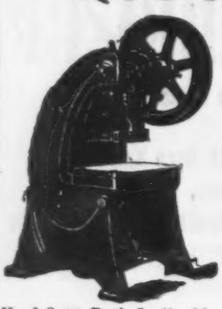
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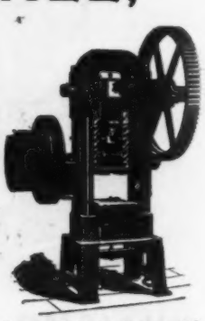
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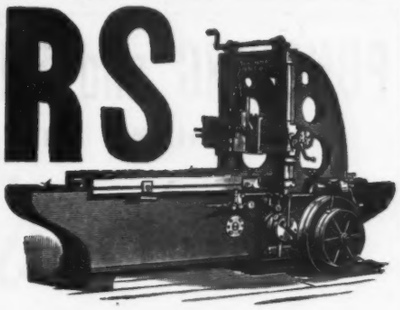
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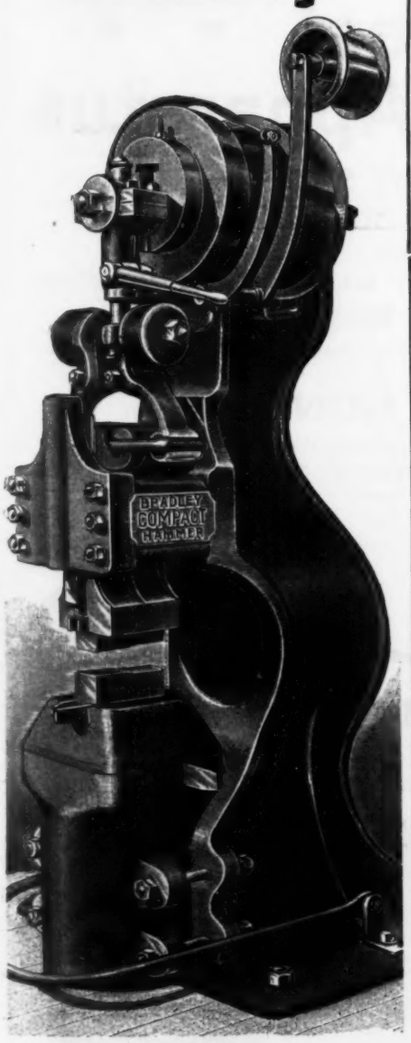


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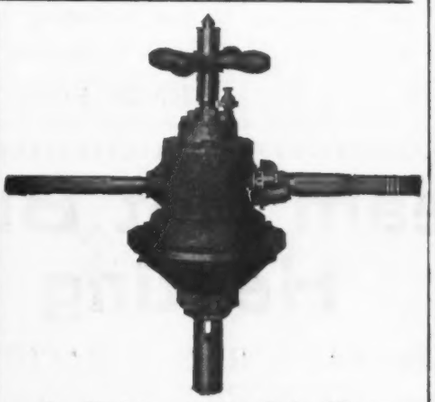


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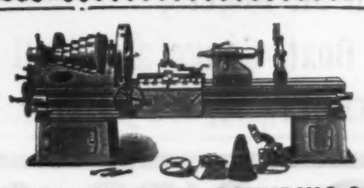
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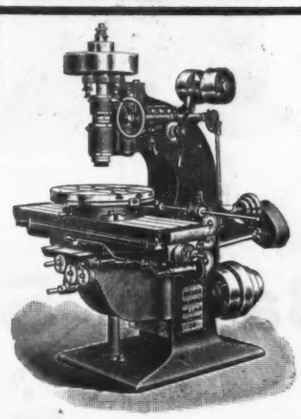
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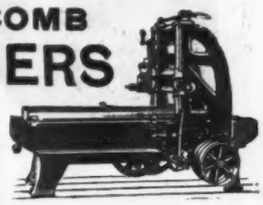
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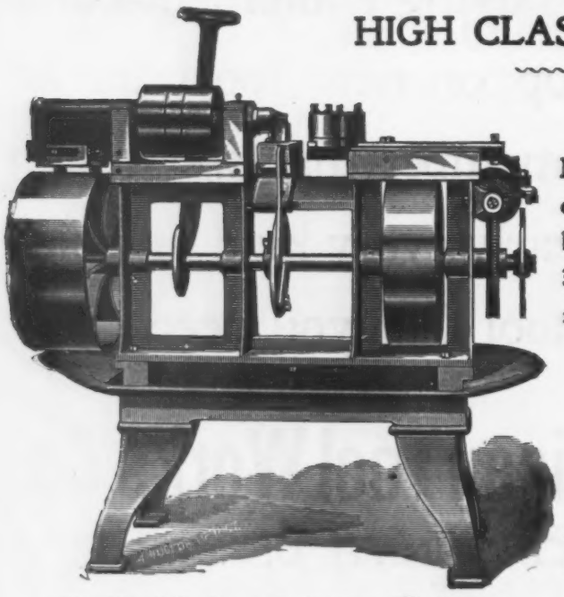
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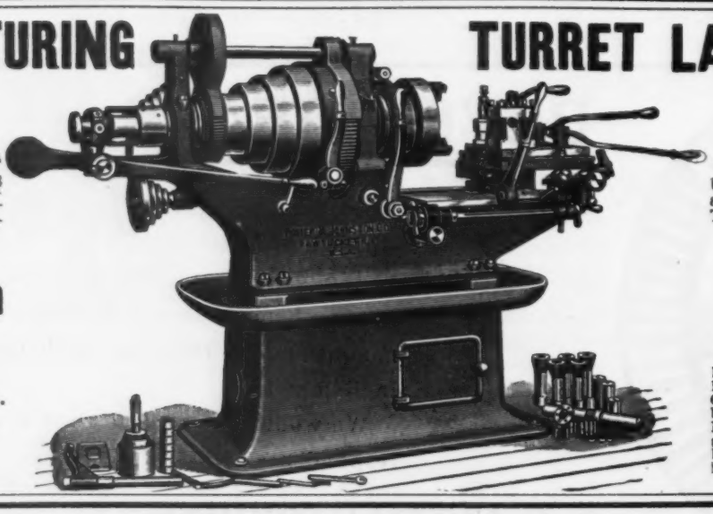
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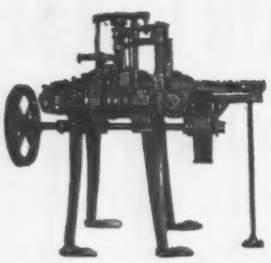
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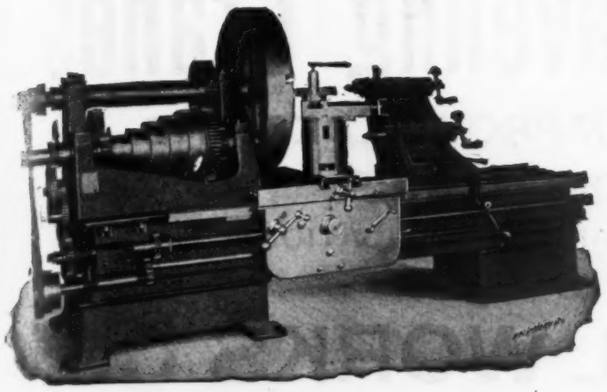
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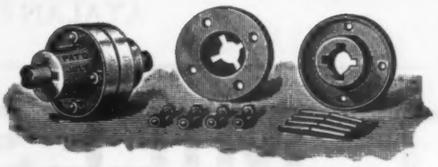
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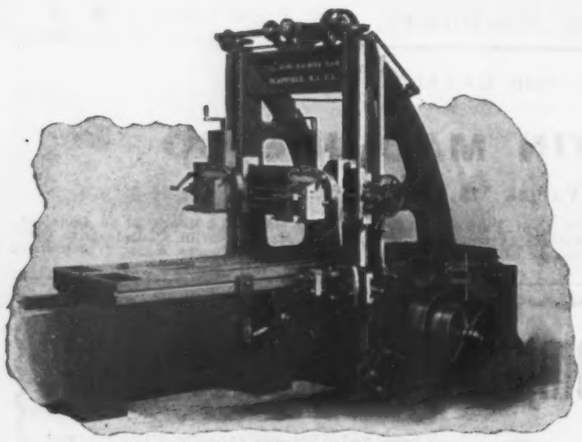
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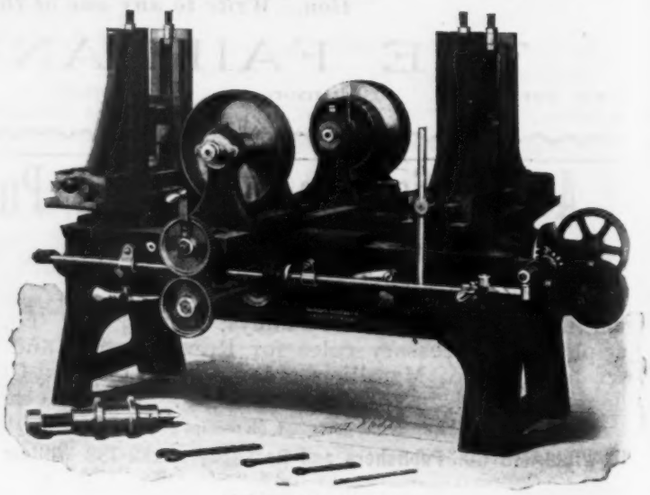
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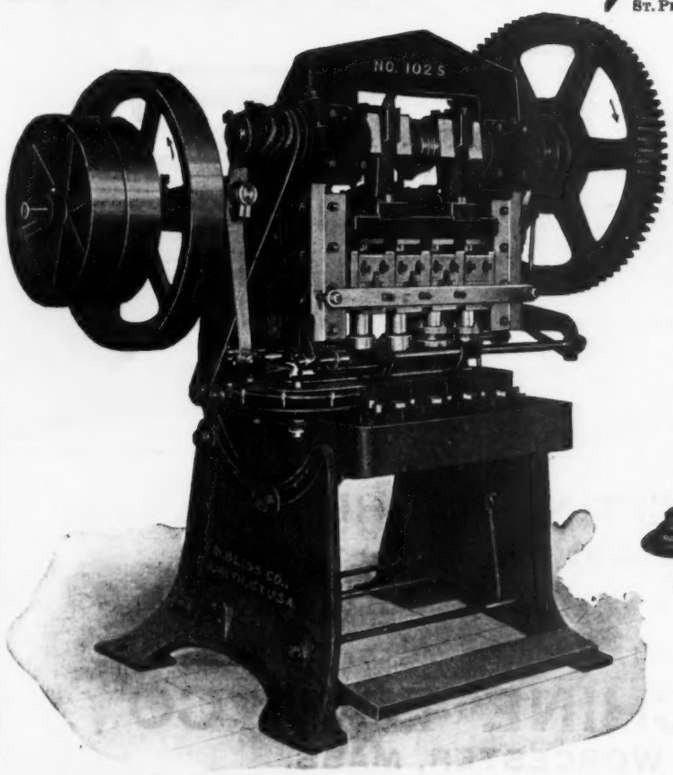


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Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5.

Weight of the machine as shown, 4,100 lbs.; T. & L. pulleys, 20 x 4 ins.; ratio of gearing, 1:6; motion of slide, 3¼ ins.; floor space required, 55 x 72 ins.

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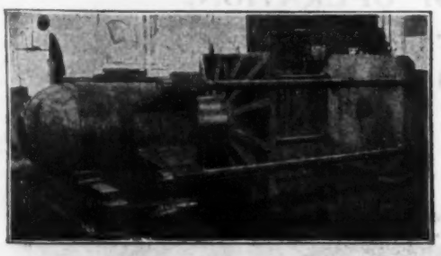
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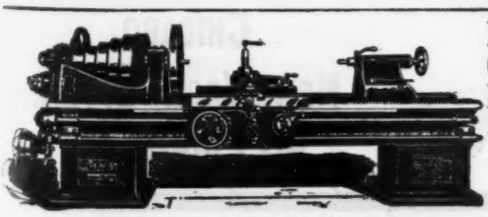
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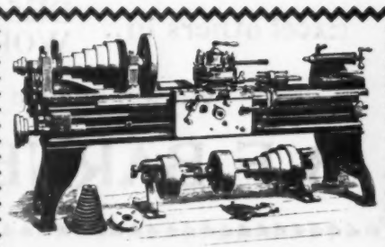
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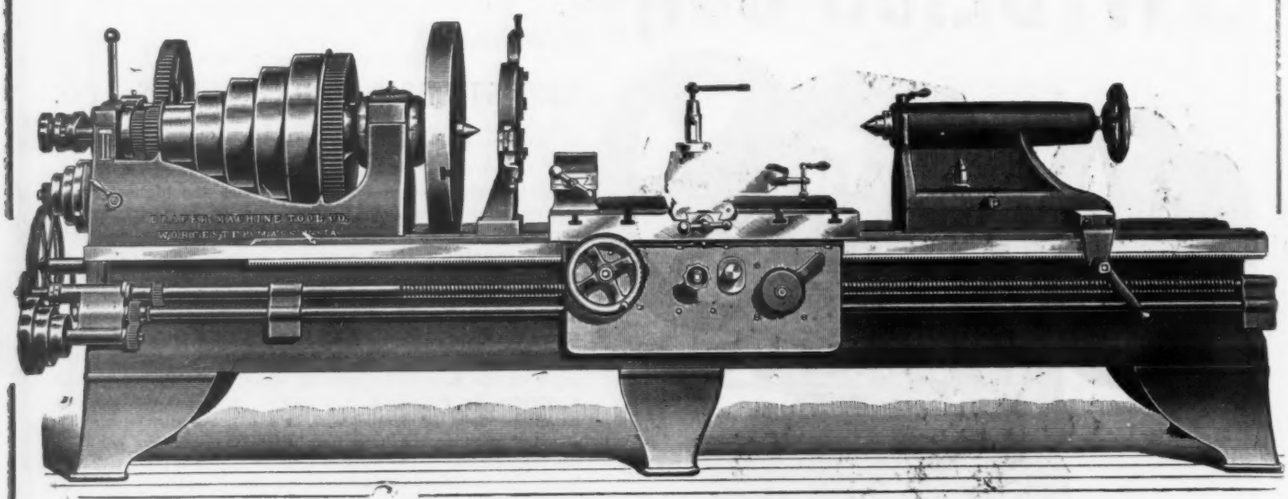
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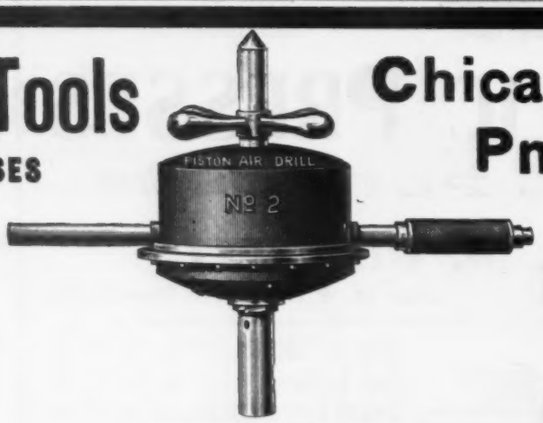
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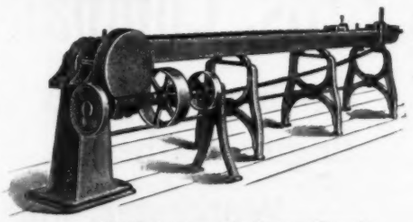


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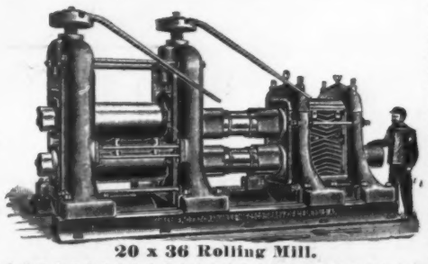
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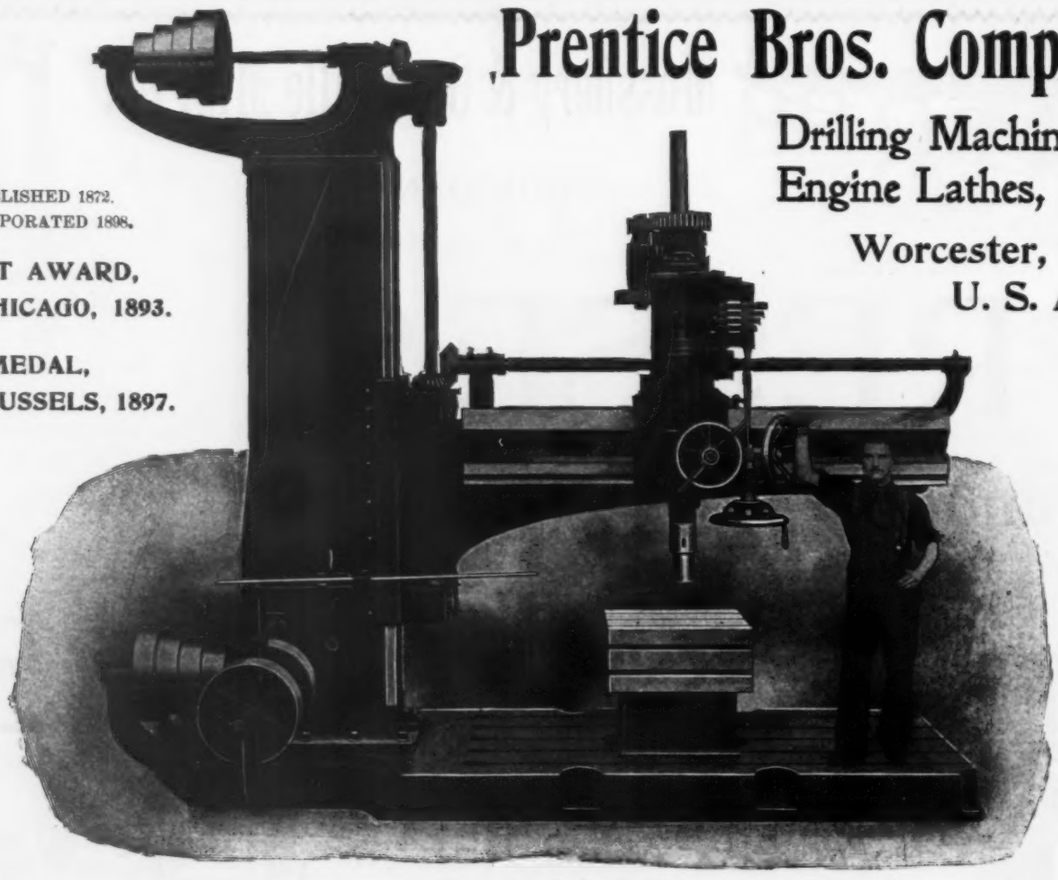
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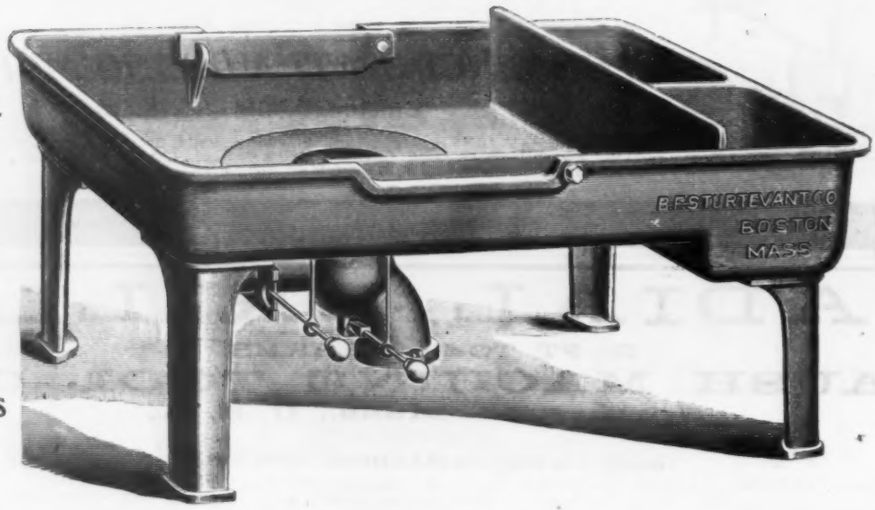
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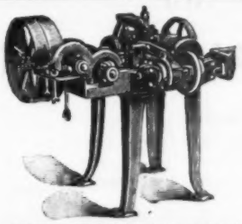
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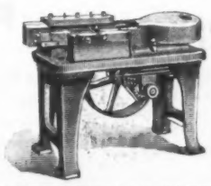
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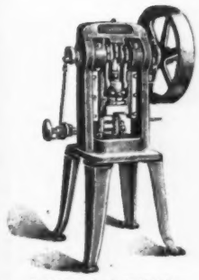
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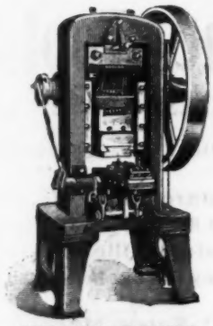
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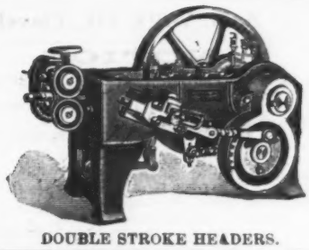
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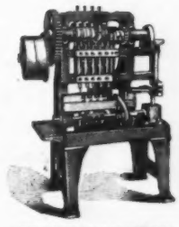
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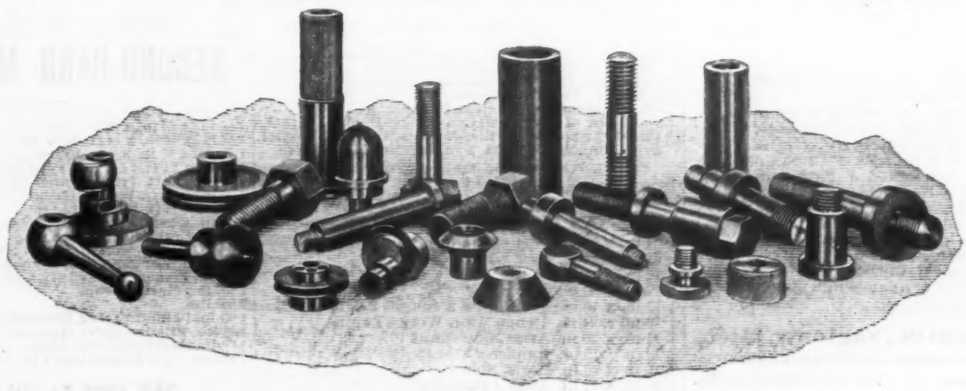


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1 54 in. x 24 ft. 6 in. Rod Feed Lathe. Cheap.
1 38 in. x 12 ft. Triple geared Lathe.
1 30 in. x 12 ft. Wright Lathe.
1 26 in. x 14 ft. Blaisdell Lathe.
1 22 in. x 18 ft. Pond Lathe.
1 12 in. Crank Shaper. Cheap.
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1 1200 lb. Morgan Steam Hammer.
1 Plate Planer, planes 18 ft. long.
1 800 lbs. Merrill Drop.
2 600 lbs. " "
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1 Combined Punch and Shear, cuts and punches ⅛ in.
1 Eaton, Cole & Burnham 6 in. Pipe Cutter.

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36 in. x 72 in. Providence Corliss Rolling Mill Engine, wheel 26 ft in dia., about 50 tons; engine left hand.
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1 14 in. x 7 ft. 6 in. Putnam R. & F., W. C.
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1 12 in. x 5 ft B. G. Speed.
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Eight 44 x 16 Tubular Boilers, 32 4 in. flues, all fixtures and trimmings.

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All bars are adjustable, each one being separately driven by a bevel pinion sliding on a feather in the main cross shaft at the top of the machine. The Mill has a range from 5 in to 12 in. cylinders. The bed is counterbalanced, and has screw vertical feed. Used only about six months, and taken out because the sale of Steam Elevators has so greatly fallen off since the introduction of the Electric Machines.

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Pair 14 x 36 Harris-Corliss; 24 x 56 Watts-Campbell; 16 x 12 and 2 11 x 12 New York Safety. 100 K. W. M. P., 3 500, 300, 150, 50 light dynamos. 2 20 H. P. crane motors, speed 500. 15 H. P., 220 volt motor, slow speed. 4 Sturtevant exhausters, 3 Buffalo blowers. Steam shovels, hoisting engines, crushers, coal mining machinery and contractors' equipment. **SEND DESCRIPTION** any machinery wanted or for sale.

CHESLEY MACHINERY CO., Havemeyer Bldg., N. Y.

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Toe Calk Manufacturing Plant, fully equipped and Machines fully covered by patents.
Address "P," care *The Iron Age*.
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BORING MILL.
60 in. Bullard Boring and Turning Mill, two hds., latest pattern.

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60 in. Newark Pulley Lathe two tools, worm driven, excellent condition.

ENGINE LATHE.
40 in. x 17 ft. Screw Cutting Lathe, triple geared, power angular feed in compound rest.

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36 in. x 36 in. x 14 ft Cincinnati, two heads.

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No. 3 Bickford Full Universal.

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No. 3 Cincinnati Full Universal, all power feeds.

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26 in. Gould & Eberhardt Extension Base, back geared.

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50 in. Gould & Eberhardt, for spurs, bevels and worms.
Send for our new catalogue illustrating the different machines which we handle.
Prices on application.

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Second-hand Machinery

IN STOCK.

1 80 H. P. 60 in. x 16 ft. Tubular Boiler.
2 125 H. P. 66 x 18 Tubular Boilers.
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1 100 H. P. Atlas Automatic Engine.
1 150 Buckeye Automatic Engine, size 15x18.
1 125 Buckeye Automatic Engine, size 14x16
1 100 H. P. Ball Automatic Engine, size 13x12.
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 12 in. vertical engine.
2 No. 6 Morris Centrifugal Sand Pumps.
1 16x10½x10 Worthington Duplex Pump.
1 12x12x10 Worthington Duplex Pump.
1 12x7x10 Worthington Duplex Pump.
1 7x4½x10 Worthington Duplex Pump
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Corliss Engines For Sale.

2 34 x 60 Horizontal Engines, one right hand and one left hand. These engines are now coupled to one shaft, but would furnish with fly wheel or band wheel to suit each separately.
1 24 x 56 Horizontal Engine with 20 ft. band wheel.

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One 18 in. x 42 in. Watts Campbell and 22 in. x 42 in. Wright Corliss Engines, High Speed Automatic. Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery

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2 Phœnix 12 x 12 engines.
1 10 x 6 x 10 Worthington Pump.
1 14 x 20 x 20 Chase Pump.
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Small Electric Light Plant.

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One 32 in. Reversing Blooming Mill with pair of 28 x 48 in engines; also live tables, table engines, hydraulic manipulator, etc., built by Mackintosh, Hemphill & Co

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A number of 60 x 18 ft. Tubular Boilers. In good condition for immediate delivery.
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Machinery Bargains.

8 x 16 Rice Automatic Engine.
11 x 11 Ide Vertical Engine
14 x 14 Sutton Marine Engine.
14 x 30 Cummer 4-valve Automatic Engine.
18 x 24 Atlas Automatic Engine.
16 x 42 Allis Corliss Engine
24 x 48 Hamilton Corliss Engine.
24 x 24 ft. Shafting Lathe.
70 H. P. Otis Steel Fire Box Boilers.
200 H. P. Berryman Heater.
200 H. P. Reynolds Heater.
200 H. P. Stillwell-Bierce Heater.
600 H. P. Rowe Feed Water Heater.
75 feet Double Leather Belt, 92 in.
90 H. P. Waste Heat, Vertical Boiler.
The above are all in first-class condition and ready for shipment.

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1 25 ton Morgan Square Shaft 50 ft. span traveling crane
2 Hydraulic Cranes.
1 Roll Lathe.
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1 12 in Fitchburg Shaper, sliding head.
1 9 in. Gould Shaper.

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1 30 x 36 in Vertical Corliss Rolling Mill Engine with 20 ft fly-wheel.
4 Second-hand Steam Pumps
1 Centrifugal Pump.
1 Second-hand Hoisting Engine.
A full line of New Engines Hoisting Engines, Shears, Grinding Pans, Stone Crushers and Contractors' Machinery.

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CUPOLAS, CRANES, LADLES BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

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No. 5 Bardons & Oliver Screw Machine, good as new, $600.00. Has all cata. attachments and forming tool slide.
16½ x 32 Allis Corliss, box bed type; right hand, 10 years old, used very little and overhauled, $800.00.
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1, 2, 3, 7, 9, 12 H P. Old Gas Engines. New, all sizes.
2, 3, 8 H.P Second-hand Boilers and Engines, cheap.
Large Paper Cutter. Gauge Lathes, Motors, etc.
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Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent), "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

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Two 35 H. P. Fischer C. C. high speed, self-oiling engines, with two 400 incandescent light Triumph dynamos with switchboard.

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ENGINES AND BOILERS.

12 x 36 Lane & Bodley Corliss
14½ x 15 Phœnix Automatic
7 x 7 Payne "
14 x 20 Atlas "
11 x 30 Fitchburg "
13 x 26 Buckeye "
} Engines.

and others second hand. Also
2 66 x 18 Hor. Tubular Boilers.
2 66 x 16 " "
Send for complete list of second-hand machinery.
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For Quick Delivery.

Single Punches and Shears,
48 in. throat, 1⅛ in. in ⅞ in.
36 in throat, 1¾ in. in 1 in.
Splitting Shears.
For ¾ in., ⅝ in. and ½ in. plate.
Double Angle Shear for 4 x 4 x ⅝ in. angles.
Plate edge Beveling Shear for ⅝ in. plate.
Guillotine Bar Shear, 17 in knife, for 2 in. square.
Gate Shear and Multiple Punch, 78 in.
Riveting and Punching Press 5 ft. gap.
Bending Rolls, 12 ft. 2 in. between housings, 100 in bet hngs. for 1¾ in. plate.
Spacing Table, hand, 8 ft.
Radial Drills, 48 in. and 60 in arm.
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Duplex Vertical Engines, 9 x 9.
Plate Planer, 6 ft. cut.

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1 30 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft; 18 ft. fly wheel in 8 sections; rim 12 in. x 15½ in.
1 18 in. x 32 in. Single Cylinder Link motion Double Drum with friction and brake band Haulage Engine, made by Webster, Camp & Lane.
The above engines are in A No. 1 condition.
For Sale by
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Machine Tools In Experimental Shop.

One 10 in. x 5 ft. Young Lathe, Compound Rest.
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One 18 in. Ohio Crank Motion Shaper.
One 20 in. Lodge & Davis Shaper.
One Brainard Plain Milling Machine, Automatic Feed.
One 30 in. Pond Style Pulley Lathe.
Two No. 2 Wire Screw Feed Machines, 15-16 capacity.
One set 6 ft. Boiler Bending Rolls.
20 in. Drill complete, auto feed.
26 in. Barnes Drill, complete.

THE FAIRBANKS COMPANY,
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FOR SALE.

One 150 H. P. Cross-compound Armington & Sims Auto. Engine. Cylinders 11¾ in. and 18¼ in by 15 in. stroke.
One 10 x 16 Plain Slide Valve Engine.
One 13 in. x 12 in. Phœnix Auto. Engine.
One 12 in. x 24 in. Wetherill Corliss Engine.
One 19 in. x 36 in. Babcock and Wilcox Engine.
One 7 in. x 10 in. Atlas Auto. Engine center crank.
One 12 in. x 7 in. x 10 in. Duplex Worthington Pump.
Also a number of smaller Engines and Pumps.
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Corliss Engines.

1 26 x 48 Allis Corliss.
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All in finest condition.

Cheap for Quick Sale.

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Round Screw Driver Blades
Send for our List of Patents.
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For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.
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1 No. 3 Fowler Press.
1 54 in. x 19 ft. Planer, double head.
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1 No. 2½ Newton Duplex Milling Mach.
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1 No. 2 Jones & Lamson Screw Machine.
2 36 in. Hydraulic Wheel Presses.
1 16 in. Slotting Machine.

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WANTED.

We wish to buy for cash the following machinery:
1 No. 9 STURTEVANT PRESSURE BLOWER.
1 No. 5 ROOT BLOWER.
1 FOUNDRY JIB CRANE, 10 ton capacity.
1 PLANER, 60 in. x 60 in. x 14 ft.
1 PLANER, 36 in. x 36 in. x 12 ft.
1 PLANER 24 in x 24 in x 6 ft.
1 72 in. ENGINE LATHE, 16 ft. between centers.
1 48 in. ENGINE LATHE, 12 ft. between centers
1 24 in ENGINE LATHE, 12 ft. between centers.
1 RADIAL DRILL, with 5 ft. arm.
1 2 in. ACME BOLT CUTTER.
1 2 in. x 24 in. JONES & LAMSON FLAT TURRET LATHE.
Good second-hand tools preferred.
Address "R,"
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FOR SALE.

1 7 ft. 13 ft. Boring and Turning Lathe.
1 20 in. x 8 ft. Engine Lathe.
2 16 in. x 8 ft. " "
1 12 in. x 5 ft. " "
1 12 in. x 4 ft. " "
1 30 x 34 x 8 ft. Worcester Mch. Co. Planer.
1 Flather's 16 x 6 ft. Monitor Fox Lathe.
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1 Upright Splining Machine.
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HANNAN & FINTON, Springfield, Mass.

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We have for sale a complete Foundry for making Stoves. Will sell whole or part.

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Drop Forge Works, building 40 x 130 ft., all fitted up with modern tools. 3 Drops. 3 Power Presses. Machine Shop. Japanning Plant. Shears. Brick Boiler House. 2 Steel 40 horse-power Boilers. 1 50 horse-power Engine. Complete Oil-Fuel Plant. Side track in yard, no shifting charges. For information address
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60 and 80 lb. Bradley Hammers.
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No. 3 Bell Steam Hammer.

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1000 dozen brand new single bit axes, all weights from 3½ to 4½ lbs., packed one dozen in a case, a full assortment of patterns such as the Michigan, Kentucky, Yankee, Western, Ohio, Dayton, Wedge, etc. Price per dozen $4.50.
One carload of cold rolled steel shafting, 1 5-16 to 4 in Get our complete list and prices.
350 solid steel anvils all sizes, 1000 cast iron anvils, all sizes and 1500 wrought steel anvils, all sizes
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A $50,000 stock of brand new brass fittings and valves.
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All kinds of iron and wood split pulleys.
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We have a job of brand new padlocks. Get our descriptions.
We have the largest machinery depot on earth
Our plant covers over 10 acres of ground and is complete with everything in the machinery line. We list a few items that may interest you Further information on application
1 10 ton Ice Machine in first-class condition This machine is at present set up in our plant and can be inspected. We solicit correspondence.

2 72 x 16 Horizontal Tubular Boilers.
2 66 x 16 " " "
4 54 x 16 " " "
2 54 x 15 " " "
1 54 x 14 " " "
2 48 x 16 " " "
1 50 H. P. Fire Box Boiler.
1 35 H. P. " " "
1 20 H. P. Upright Boiler.
2 15 H. P. " "
1 10 H. P. " "
1 15 H. P. Combined Engine and Boiler (locomotive).
1 8 H. P. Upright Combined Engine and Boiler.
1 4 H. P. " " " " "
1 10 H. P. " " " " "
1 10 H. P. Hoisting Engine and Boiler combined, on wheels.
1 8 H. P. Hoisting Engine and Boiler combined, on wheels.
1 Locomotive Traveling Crane.
1 18 x 42 Frick Corliss Engine.
1 20 x 32 Watertown Automatic Engine.
1 18 x 28 " "
1 20 x 24 Plain Slide Valve Engine.
1 14 x 18 4-valve Russell Engine.
1 13 x 18 Center Crank Erie City Engine.
1 14½ x 18 Armington & Sims High Speed Automatic Engine.
1 12 x 12 Armington & Sims High Speed Automatic Engine.
1 12 x 12 Ideal High Speed Automatic Engine.
1 10 x 15 Meyers Fixed Cut Off Engine.
2 10 x 14 Plain Slide Valve Engines.
1 Pair 10 x 14 Atlas Engines, on one base.
2 6 x 8 Plain Slide Valve Engines.
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1 50 H. P. Otto Gas Engine.
1 12 x 6 x 18 Norwalk Iron Wks. Steam Pump.
1 12 x 6 x 12 Cope & Maxwell Steam Pump.
1 No. 6 Knowles Steam Pump.
1 No. 5 Marsh Steam Pump.
1 14 x 9 x 16 Norwalk Air Compressor.
1 6 x 8 x 6 Clayton Straight Line Air Compressor.
1 250 H. P. Baragwanath Feed Water Heater.
1 125 H. P. " " " "
1 75 H. P. Excelsior " " "
1 No. 4 Goulds Power Deep Well Pump.
1 No. 3 Cook Well Co. Deep Well Steam Pump.
1 No. 12 Double Shavings Exhauster.
1 No. 9 Single Shavings Exhauster.
1 No. 10 Sturtevant Steel Plate Blower.
1 No. 8 " " "
1 36 x 36 x 12 ft. New Haven Planer.
1 25 x 25 x 9 ft. Pond Planer.
1 18 x 8 Ross Plain Engine Lathe.
1 Westinghouse Dynamo, 100 lights with Exciter
1000 Arc Lamps.
10,000 lbs. Weatherproof Wire, all sizes.
10,000 Incandescent Lamps.
2 11 x 12 New York Safety Engines, with shaft and clutches, to operate together, or will sell separately.
2 16 x 60 Tubular Boilers.
1 14 x 16 Automatic Smith Beggs & Rankin Engine.
1 50 H. P. Raymond Gasoline Engine.
1 9 x 10 New York Safety Engine.
1 Slattery Alternator, 1200 light capacity, 1000 volt, with Exciter and instruments.
1 14 x 20 Single Valve Russell Engine.
1 13 x 18 Four Valve Russell Engine.
1 Oil Crusher.
1 Stone Crusher.

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SPECIAL ENGINES.

1 14 in. x 20 in. (Vertical) Slide Valve.
1 14 in. x 30 in. Keystone Corliss (Brand new).
1 11 in. and 19 in. x 24 in Tandem Comp'd "Buckeye" (latest type) with condenser.
1 22 in. x 42 in. Wetherill Corliss.
1 23 in. x 48 in. Geo. H Corliss make.
1 24 in. x 36 in Mackintosh, Hemphill & Co.
1 36 in. x 60 in. Tangye Bed type.
1 Crane Elevator Co. Modern Elevator Engine.

BOILER.

1 Horizontal Tubular, 72 in. x 16 ft., with 84 3½ in. tubes, approved for 100 lb. pressure, complete.

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15 Very fine Forged Shafts, finished all over, 10 in diam. to 16 in.

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Very fine steel self-supporting stack, 64 in. diam., 100 ft high, with base casting, ornamental top and ladder.

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1 Hackney Cushion Hammer.
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1 4 ton do.

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1 New Alligator Shear with capacity up to 2½ in. Cold Billets, or for Scrap cutting. Knives 14 in. long.

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*Signifies Right-hand.
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Machinery Bargains.

DOUBLE ENGINES.

18 x 42 Slide Valve, horizontal box, bed plate, shaft 8¾ in. diameter, double cranks, 8½ in. pins, built by Starbuck, with or without belt wheel, $1,200 00.

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48 x 48 x 16 ft. bed, made by Rollins, Nashua, N. H. Price, $800.00.
34 x 34 x 15 ft bed, made by Fairbanks, Providence, R. I. Price, $500.00.

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Two 16 in. swing, 6 ft. bed, made by Putnam Price, $125 00.
One 15 in swing, 6 ft. bed, made by Wood & Light. Price, $125.00.
Two 18 in. swing, 8 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, $125.00.
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One double head lathe, 32 in. swing, 20 ft. bed, made by Campbell & Gage, Waterford, N.Y. Price, $500.00.

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1 Second hand Corliss Engine. 14 in. x 42 in.
1 Blake Stone Crusher, 15 x 9 with screen
1 Dean Duplex Steam Pump, 5 x 3¼ x 5.
3 Edson Diaphragm Pumps.

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Wanted to Make

We have a complete modern manufacturing plant near Boston, equipped with **Power Presses, Automatic Screw Machines, Nickel Plating and Polishing Plant** and want to correspond with parties having articles that can be made in such a factory. Address

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WANTED.

A good second-hand drop press, about 300 lb. drop.

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One Pond Planer, 36 x 36 x 17 ft.

One New Haven Lathe, 25 in. swing, 16 ft. bed.

One Vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

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One Corliss Engine, 26 in. x 60 in., fly wheel 20 ft. diameter, section of rim 15½ in. x 11 in. One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co for drilling holes in plates.

Five trains of plate rolls. One 9 ft Flywheel, new, 7 in. bore, weight 6000 lbs Two Bliss Guillotine Upright Shears, 72 in. gap, 8 in. stroke. One Dean Duplex Pump, 6 x 5½ x 6. One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening rods up to 3 in. diameter and 25 ft. long. A lot of extra cold and hot plate rolls (new) and numerous other items from the Olney Copper Plant.

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SECOND-HAND, FIRST-CLASS ORDER.

3-16 in. Adt Bench Rotary Wire Straightener with loose pulley, five dies on stand.
⅛ in. Adt Automatic Wire Straightener and Cutting-off Machine 16 in. lengths and under.
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50 lb Power Hammer (Dinelt & Eisenhardt)
25 lb. Bradley Helve Hammer.
40 lb. Bradley Helve Hammer.
500 lb. Merrill Board Lift Automatic Drop Hammer
1500 lb Morgan & Williams Double Standard Steam Hammer.
800 lb. Pratt & Whitney Board Lift Automatic Drop Hammer.
No. 7 Jarecki Pipe Machine.
3-16 in. Adt style "D" Riveting Machine.
4 in. to 6 in. Curtis Pipe Machine, hand and power.
Single spindle Profiler (Garvin).
No. 1 Warner & Swasey Screw Machine with wire feed.
No. 1 Bliss Foot Press
No. 2 Plain Milling Machine (Reed)
Brown & Sharpe Polishing and Finishing Lathe
No. 3 Garvin Hand Miller
No. 2 Garvin Hand Miller.
No. 10 Kempsmith Hand Miller.

C. C. WORMER MACHINERY CO.,
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Bargains in Locomotives.

Ten 16 x 24 Standard Gauge Locomotives, weight 33 and 35 tons; also one 20 ton Standard Gauge Locomotive, all with tenders; one 30 in. Gauge Locomotive and one Standard Gauge Saddle Tank Locomotive, weight about 9 tons. One 15 ton Buffalo Pitts Road Roller and one No. 3 Gates Crusher mounted on wheels.

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A Small Portable Iron Annealing Furnace, second-hand.

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A foundry plant in complete operation, employing 40 molders, and doing a large and profitable business, making a line of staple specialties, sales of which can be increased to almost any extent. The plant is situated in an inland city in a central Western State, and railroad facilities are exceptionally good The owner wishes to retire This is a splendid opportunity for a good practical foundry man with some capital; or a partnership could be formed with the practical men in charge of the different departments. Address

"FOUNDRY PLANT,"
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FOR SALE,

SECOND-HAND TOOLS.

Three "Bryant" Cold Saws.
One "Whitcomb" Planer, 37 in. x 36 in. x 9 ft.
One "Cockburn" Concrete Mixer.
One "Sturtevant" Blower, No. 8.
One do. do. No. 5.
Two Horizontal Tubular Boilers, 66 in. x 16 ft. with 90 three-inch tubes, now running under 80 lbs. pressure.

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NEW CORNELL BLOWERS—Poole's patent, all sizes—the best in the market—send for prices.

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1-20 in. x 48 in. Corliss Engine 1-8 in x 12 in. Erie Engine. 1-11 in x 24 in. Slide Valve Engine. 1-4 in. Morris & Tasker Pipe Cutter and Threader. 1-30 in. Blaisdell Back Gear Drill. 3-125 Horse Horizontal Tubular Boilers 1-150 Horse Horizontal Tubular Boilers. 3-20 Horse Upright Boilers 1-Boiler Plate Planer, built in Scotland. 1-Hydraulic Riveting Machine, 86 in. gap. 1-Power Shears. 1-48 in Swing Lathe, short bed. 1-12 x 24 in. Lathe. 1-Horizontal Boring Machine. Several small lathes. 1-Double Arbour Milling Machine 3-New Woodward Steam Pumps. 2-Double Belts, Hoyt's make, 104 ft., one 86 ft., 18 in. wide Large stock same make smaller belts. ROBT. J. GRAY 52-54 East 132d St., New York

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These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,
Land and Industrial Agent, Southern Railway,
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FOR SALE.

ENGINES, SLIDE VALVE.
1 Pair Twin 12 x 18 McCune.

ENGINES, AUTOMATIC.
1 12 x 20 Atlas
1 16 x 24 "
4 11 x 11 Westinghouse.
1 16 x 24 Warren.

BOILERS.
1 72 x 16 3½ in. flues.
4 72 x 14 4 in. flues.
1 50 H. P. Upright
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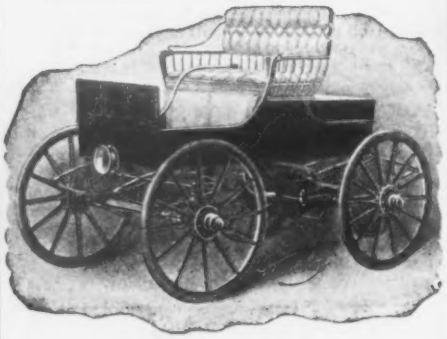
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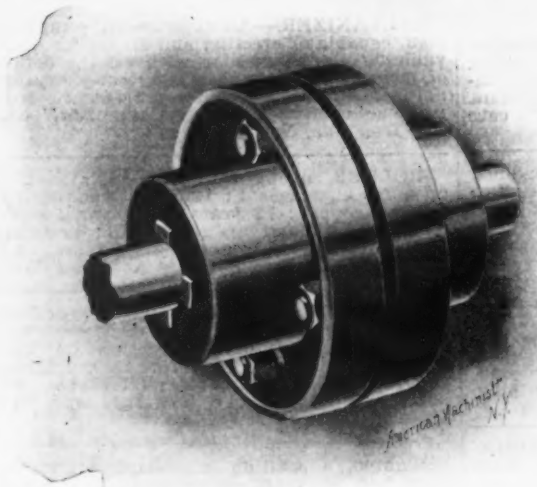
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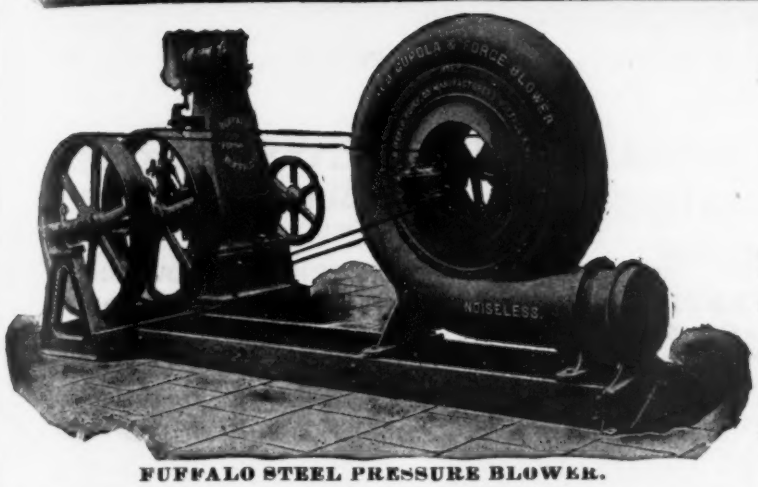
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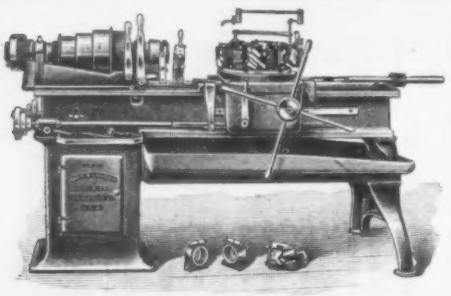
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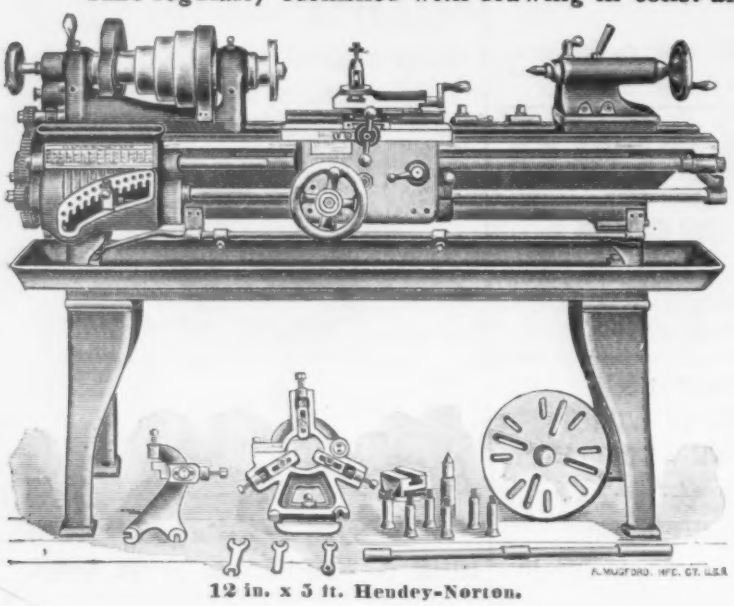
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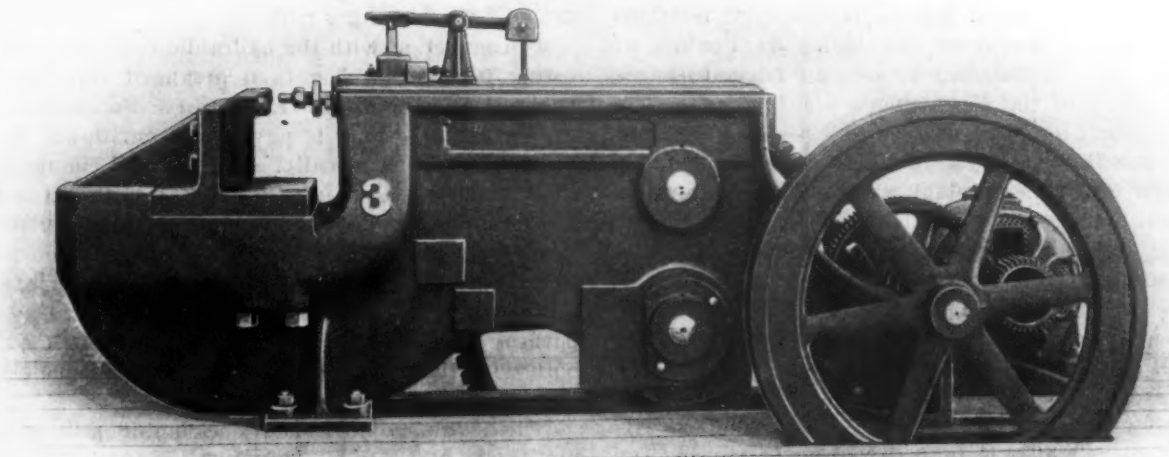
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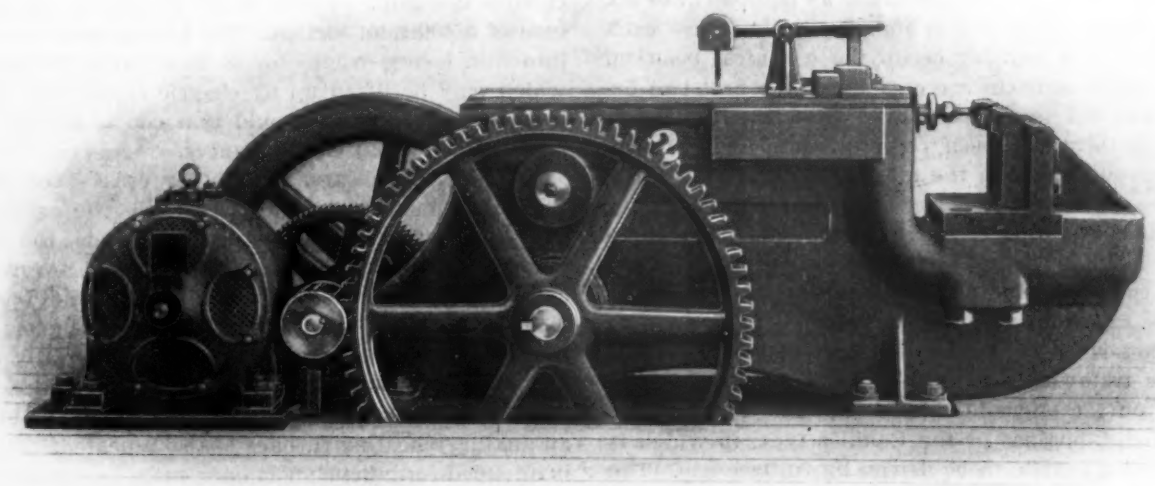
THE IRON AGE

THURSDAY, JULY 12, 1900

The Hilles & Jones Horizontal Punches.

The half-tone engravings here presented show a variation in the ordinary type of horizontal punches. As usually built these machines are supplied with a clutch on the main spur wheel, operated by a foot lever, but in this case the spur wheel is keyed direct on the eccentric shaft so that the sliding head works at all times when the motor is in operation. To take the place of the clutch a gag is supplied working back of the punch stock and controlled by two hand levers. There are two springs back of the punch stock which keep the punch extended to its limit, so that when it strikes the plate, if the gag is not in place, the springs will be simply compressed and no hole punched. This is operated the same as gag punching on a vertical machine, the springs being necessary on the horizontal punches to keep the punch extended. The die blocks in both cases are heavy steel castings, which back up against solid lugs of the main frame; they are held in position by large through bolts, making a very substantial backing for the filling block and small die block which is bolted to it. The small die block may be readily removed if other special forms are to be used. Both of these tools are driven by motors driving through cut gears, and are intended for punching angle iron and other structural material in shipyards, bridge shops, steel car plants, &c. The whole machine is complete on one foundation, and the driving shaft is carried in babbitted bearings with caps which are readily removed if necessary. Machines of this type are built in varying capacities from ⅞ x ¾ inch to 1½ x 1½ inches, and in depths of throat from 6 to 60 inches, by the Hilles & Jones Company of Wilmington, Del.





THE HILLES & JONES HORIZONTAL PUNCHES.

The Champion Iron & Steel Company, Muskegon, Mich., are running their bar, tin plate and sheet mills full, having settled the scale with their employees.

The Minette District of Lorraine, Luxemburg and France.—III.

EDITORIAL CORRESPONDENCE.

Another of the great new undertakings in Lorraine is that of the

Lothringer Huettenverein Aumetz Friede

at Kneuttingen, a company whose headquarters are at Brussels. It is the creation chiefly of Arnold Steingroever of Trier, and was formed by the fusion of the Aumetz Belgisch-Lothringer Gruben u. Huettenverein, with mines at Aumetz, and the Société An. des Hauts-Fourneaux de la Paix, with mines and two blast furnaces at Friede, near Hayange. The company has a share capital of 15,000,000 francs and an issue of 5,000,000 francs of 4 per cent. bonds. It has close relations with the Société Anonyme des Mines de Fontoy, at Fentsch, which is building two large blast furnaces within gunshot of the Kneuttingen plant, to whom its pig iron product has been sold for a series of years, and to which it will be conveyed in a molten condition.

The new Kneuttingen plant was built by C. Dowerg, the general manager, the chief engineer being E. Focke, while the commercial manager is F. Friedhoff. The conditions dictating the location of the plant were somewhat peculiar, the two La Paix, or Friede furnaces, having been placed so that the ores of the Friede mines in the hill back of them could be delivered direct to the tunnel head. They were located on the side of a hill facing the junction of the Fentsch River, and the Algringen Valley, which is tapped by one of the busiest mineral roads. The opportunity was thus offered to lay out the plant in three levels: The first, that of the ore supply; the second, that of the pig product, and the third, that of the rolling mills, which connects at either end with the shipping tracks of the State roads. The difference in level between the furnace tracks and the mill tracks is 13.4 m., which is ample to allow of pouring the liquid metal into the mixers, then into the converters, and from the latter casting the ingots on the mill level without lifting the molten iron. The ground was such that very extensive excavation and filling has become necessary, the total anticipated earthwork footing up to close to 1,000,000 c. m.

The plans as laid out contemplate an equipment of six blast furnaces, which are to stand in a row, three each on one side of a foundry occupying a central position. Of these three furnaces are completed, the first two being the original ones taken over from the Société la Paix. The third has been recently completed. It was placed far enough from the others to leave room for a cast house. The present furnaces have a daily capacity of 130 tons, but it is the plan to have the next three come up in their production to 160 tons per day. This, with the two Fentsch stacks, would carry the supply up to 1100 or 1200 tons a day.

The slag is to be granulated, and to be carried by wire rope tramway to a cement plant now under construction on the opposite side of the valley. There are three blowing engines of the Couillet type, to which is to be added a fourth, to be driven by furnace gas. The engine will be built by the Otto Company, at Deutz, while the blowing tubs are to have the Riedler valve.

The pig iron from the furnaces is delivered by ladles to the two mixers, each of which has a capacity of 140 tons. The ladles are tilted by an electrical crane. From the mixers the iron is poured into ladle cars, which are hauled to the adjacent Bessemer shop by a chain actuated by an electric motor. The plan contemplates the use of four 20-ton converters, of which three are now in operation, the stands for the fourth being in place.

The blast is furnished by a heavy blowing engine built by the Gutehoffnungshuette, at Oberhausen. They are equipped with the Riedler valve, which is to be tested for this service. The engine has run at a speed of 60 revolutions. A second engine of the same general type by the Union of Essen is to be put in later on.

The steel is poured from the converters into ladle cars, one of which is equipped with steam, while the other is driven electrically. The ladle may be swung over a large circle, and pours direct into ingots placed in a straight pit. This is controlled by two electric cranes, one running on the upper and one on the lower flange of the runway, by which molds and ingots are handled, they sweeping also the soaking pits and the table of the blooming mill.

In connection with the hydraulic service a very interesting installation has been arranged for. The pump now installed, built by Ehrhardt & Sohmer, is driven by steam. A second is now being put down, which is to be operated electrically. The motor is connected with the pump end by a magnetic coupling so that it is started and stopped automatically from the accumulator, the motor revolving constantly. The steam driven and the electrically driven hydraulic pumps are so designed that the steam end may be removed and the electric apparatus be substituted, so that it is possible to equip both with the motive power which experience shows to be best adapted to the service.

The ingots go to a heavy blooming mill with 1250 mm. rolls and 2.9 m. between housings. The mill is driven by a four-cylinder tandem compound engine built by Sack & Kiesselbach of Raht bei Duesseldorf, which has given excellent results elsewhere, and notably at Krompach. The roll gears are cut and placed in a closely fitting box under the Ortmann system, the entire gears running in oil. The train is placed in a cross shed, and is commanded from end to end by a 40-ton electric traveling crane.

The roller tables are driven electrically through the intervention of belting, a hydraulic cylinder being used to operate the belt shifter.

The blooms are run to one of two Breuer Schumacher steam hydraulic shears, a horizontal being capable of cutting 250 mm. square, while a vertical shear takes care of a 400 mm. section. The blooms may be charged into iron boxes, whose top is flush with the floor, and which may be lifted up by electric crane and delivered to a heating furnace, should that course become necessary under special circumstances.

Beyond the shears, in another cross shed, lie two trains, commanded by two 20-ton electric cranes. The first is a 920 mm. train, with four stands, the first set being so arranged that it may be used for roughing smaller ingots in case the blooming mill is not operating. The train is driven by a tandem four-cylinder engine, and has the same arrangement for electrically driving the rollers through belting and gearing, reversed by hydraulic shifter. The use of boxes to deliver billets to an auxiliary heating furnace is also repeated. This train is intended for billets, short bars, rails, heavy shapes, &c.

The second train is a double 750 mm. three-high, both sides being driven by an engine lying between them. This engine is a three-cylinder horizontal, but may also be used as a compound by introducing the fresh steam into one cylinder and expanding into the two others. It may also be used as a reversing engine. Either train is able to roll blooms, or billets, or the different shapes. An electric transfer system of fingers sliding in cross slots makes it possible to carry bars from any part of the 920 mm. train to the others, the idea of the arrangement being that two of what are practically three trains can always be kept in operation.

For the billets as they come from the mills two saws are provided, the pieces being cut to length by a horizontal shear coupled with an automatic billet loading arrangement, designed by Mr. Dowerg. The billets are dropped into a car located in a short stretch of tunnel in which it may be entirely submerged or sprayed with water. The car bears a curved grid of heavy bars, so that an electric crane may readily run a series of fingers under the billets and lift them off bodily. The car in the tunnel is pushed onto a hydraulic elevator, which lifts it up to the mill level.

On the other side of the steel mill it is proposed to put down a 500 mm. three-high train, a 450 mm. three-high, and a double 300 mm. two-high train, the purpose being to roll the entire line of rails and shapes, with the exception of ship shapes, bars, bands and rods. At present the mill has sold what product it can deliver for nearly a year to come in the form of billets. As the pig iron supply increases and mill after mill swings into line, the output will grow. It is estimated that it will reach 180,000 in the first year, 240,000 tons in the second year, and will grow until from 1200 to 1500 tons of pig iron will be treated daily.

The utilization of the furnace gas is, of course, occupying the thoughts of the management closely. Besides the Otto-Deutz blowing engine referred to there are to be put in, for the electric central station, one 650 horse-power Cockerill gas engine and a 720 horse-power Nuernberg and Augsburg engine, the operation of which will be closely studied to determine the selection for further equipment.

The foundry, which is placed in the center of the line of blast furnaces, is a handsome building, along one side of which are placed a large cupola, a moderate sized open hearth steel furnace and an air furnace, all of which equipment is to be duplicated later on. The arrangement is such, too, that direct metal from the blast furnace may be cast. The foundry is to be used principally to make the necessary steel and iron castings for the plant, including rolls, ingot molds, &c. It is possible, however, that a line of merchant work will also be taken up. The foundry floor is commanded by two 40-ton cranes, and the center strip and the yard beyond on each side by a third 40-ton electric shipping crane.

The present electric station is equipped with one 200 horse-power engine for electric lighting and a 1000 horse-power Nuernberg vertical compound. There is also a storage battery plant.

An enormous amount of work has been thoroughly done at Kneuttingen in a record time, so far at least as Europe is concerned. The first blow was made in one year and three days after the first spadeful had been turned, a proof that the Germans, too, know how to "hustle." Your correspondent's visit was within a week of starting, and billets were being rolled at a good rate.

The Aumetz Friede Company are also doing a piece of very large work in mining. For opening up the Aumetz concession of about 300 hectares, they are sinking a very large shaft to a depth of about 210 m. This is to be equipped with two sets of hoisting engines, a Riedler pumping plant, and is to develop a capacity of 4000 tons of ore per day. This ore will not be hoisted to the surface, but will run out of a tunnel which is being driven from the immediate vicinity of the Kneuttingen works. The tunnel will be 11 km. long, and will possess extraordinary dimensions. With the ores of the Friede mine, which produces from 900 to 1000 tons per day, the company will be amply supplied, the entire ore requirements coming to the plant besides, on private tracks.

The Société Metallurgique de Sambre et Moselle, which has three new furnaces at Maizieres, has, after careful studies, decided to build a steel plant at that point. The company has a rolling mill at Montigny-Sur-Sambre, in Belgium, and possess coking ovens at Dechen, near Saarbruecken, in the Saar district. It is estimated that the production will be about 100,000 to 120,000 tons of steel.

The New Works at Differdingen.

The Differdingen plant is another brilliant example of modern steel works construction in which economy of labor has been aimed at so far as mechanical appliances are justified by conditions in Germany. Max Meier, the general manager, has closely studied American methods and has frankly adopted those which his judgment dictated, a good deal of the machinery being built in the United States. The steel plant, which was recently started, was completed in 13 months after the start had been made, in spite of the fact that delays were experienced in the delivery of material and machinery.

About two and a half years ago the Differdingen works were started with two blast furnaces. A third is to blow in within the next few weeks, and a fourth has been started, which is to begin making iron toward October or November. Next year is to witness the erection of a fifth furnace, whose dimensions will probably be larger than the first four. The charging arrangements of the first set of two furnaces are now being remodeled. For the usual elevator a wire rope elevated tram is being put in, the buckets being filled from very large storage bins which are now being built and which are to contain a week's supply.

These storage bins are filled either from mine cars, which bring the siliceous ores from one property, or from a wire rope tramway, which will carry calcareous ores from another mine nearly 7 miles away. This modification of the furnace charging arrangement will cut down the force for the ore to three men below and two men above per furnace per shift. An effort is being made to induce the Government to put into use 25-ton cars of American type for hauling the coke, which comes from Westphalia, the company owning the Dannenbaum colliery in that district.

Herr Meier has gone forward with energy in the all important question of utilizing the blast furnace gas direct without the intervention of the boiler and the steam engine, for the production of the blast and of electrical power. He has ordered nine gas engines of 620 horse-power each from Cockerill, at Seraing, of which three are to be used for driving dynamos and six for blowing engines. The first of each class is now fast approaching completion. There are also two 75 horse-power gas engines to be used for electric lighting, a series of storage batteries being interposed. Herr Meier, in addition to the dust catching arrangements at the furnace, has put up a series of vertical pipes along the end of the engine house, and then conducts the gas, in order to cool it, through a long pipe of spiral section, in which a water seal is provided.

Herr Meier estimates that about one-fifth of the gas usually consumed to raise steam under good boilers for the blowing engines of the furnace is all that is needed when the gas is used direct in the gas engine. In other words, four-fifths of the gas usually consumed under the boilers becomes available for other purposes.

He figures that under the conditions at Differdingen five furnaces will certainly make enough gas to operate all the machinery required for the blast furnaces and for the steed plant which turns their pig iron into finished shape, without any coal with the exception of that required for the Bessemer blowing and the blooming mill engines. For these a battery of coal fired Babcock & Wilcox boilers are in place.

Where coal is dear, as in the Luxemburg district, the importance of this saving cannot be overestimated. It means a lowering of cost of roughly 3 marks per ton, and to that extent confirms the great advantages which the plants at the iron mine have over those at the colliery.

The iron from the furnaces is carried to two 250-ton mixers. A Uehling casting machine is also provided, the plan being to run all the furnace iron week days and Sunday into the mixers, and on Sunday, after passing it through, running the metal over the Uehling machine. In this way the mixers are kept hot on Sunday, so that on Monday morning they are at once in good shape. The usual method of casting the Sunday iron into beds, at steel works, makes the Monday start difficult, and in basic Bessemer runs up the waste as much as 2 per cent., the normal waste being 12 per cent.

From the mixers the iron goes to the basic Bessemer plant, which has three 18-ton converters in place, with the stands in position for the fourth. The equipment for the lining is adjacent to the converter shop. It consists of two dolomite calcining cupolas, a Chile mill, a mixer, a Versen bottom stamping machine and a brick press, all driven from a motor which also operates the accumulator pump for the press. In this connection mention may be made of the fact that the burnt lime used for the basic addition is delivered into pockets at the mill, from which it is conveyed by ropeway to the top of the converter house.

After the blow, which lasts about 12 minutes, the slag is poured into slag car, while the steel is cast into a ladle mounted on a car with the necessary appliances for swinging and raising and lowering. The slag which it is not quite possible to keep out of the steel ladle is poured into a box, and while it is chilling a hook is inserted which renders it an easy matter to handle it with the overhead electric crane commanding the casting pit. The ingots are cast on cars, which are handled into and out of the shop by locomotives. Adjoining the casting shop, and commanded by the same 15-ton crane, is the engine room. In this there is a very fine and massive horizontal compound blowing engine built by the Koelnische Maschinen Bau Anstalt, at Bayenthal, with 1350 and 2200 mm. steam cylinders, 1750 mm. blowing tubs and 1500 mm. stroke. The engine has a central lubrication plant. A highly interesting installation in connection with it is an electric pressure call, which is duplicated at the converters. It is by A. Wiesenthal of Aix-la-Chapelle, and enables the blower to dictate

at any time to the blowing engine engineer what pressure to carry. The response, as witnessed by your correspondent, is immediate.

The blowing engine is to be duplicated at an early date. In the same room are two hydraulic pumps, at present driven by steam, but so arranged that they will be run by electric motors. For present purposes, and later as a reserve, a 500 horse-power triple expansion vertical steam engine is being finished to furnish electric power.

The steel ingots are hauled to a station, and thence to the two strippers built by Henry Aiken of Pittsburgh. They are handled into and out of the vertical pit heating furnace by a wide span five-motor electric crane, built at Benrath, very similar in general design to the Aiken crane. This delivers it to the rollers of the blooming mill, a 1100 mm. train with rolls 2.8 m. wide, the pinion housing being closed for constant lubrication, the design being that of Mr. Meier. The train was built by the Duisburg Maschinen Fabrik, and, contrary to the usual German practice, has the roller tables 750 mm. above the mill level. The rollers on one side of the train are driven by steam, on the other side electrically, with hydraulic belt shifting gear. The manipulators front and back, of the usual American type, are hydraulic.

The blooming mill is driven by a handsome horizontal reversing engine built by the Elsaessische Maschinen Fabrik, at Muelhausen Elsass, with a steam reversing gear and oil governor to take up shocks. It is capable of driving at a very high speed.

What is to be practically a duplicate of this blooming mill is now being built by Gebrueder Klein of Dahlbruch, which is to serve incidentally as a reserve of the first blooming mill, but is principally to be used to break down the ingots and shape them for the new Grey universal beam mill, which Differdingen is the first to introduce. This is the development of the York mill, which was erected experimentally at Duluth, and was further worked out by Grey, who was formerly with the Cleveland Rolling Mill Company for years. The Grey syndicate bears one-half of the cost of erection, the machinery being built by the Société Cockerill of Seraing, Belgium, while the chilled rolls are made in Birmingham, England. Work on the erection of the blooming mill has commenced, and will start at an early date on the Grey mill. The plan is to make the usual standard sections of beams and two additional series with wider flanges and thinner webs. Besides, beams up to 36 inches in depth will be made. Rolling mill men generally will watch with keen interest this latest undertaking.

Returning to the blooming mill now in operation, it may be noted that the blooms are cropped by a horizontal hydraulic shear. When they are to be shipped they are carried along by the electrically driven rollers to a vertical shear, and fall upon an elevated electric conveyor, modeled after those at Duquesne, from which they drop upon the shipping bank, being placed on cars on a depressed track by a traveling jib crane. The crops are loaded by inclined conveyor.

The blooms which are destined to be rolled into billets and the smaller beams and shapes are lifted off the rollers by hydraulic fingers and slide laterally to the driven rollers of the billet mill. Since these blooms are 160 x 140 mm. in section they are tipped on edge by a simple and ingenious contrivance.

The billet train has only one set of rolls, 800 mm. in diameter, with rolls 2.2 m. in length, the train being driven by a reversing compound tandem engine by Sack & Kiesselbach of Raht, near Duesseldorf. The same engine drives also a three-high train of 700 mm. rolls, which is used for making beams, channels and shapes up to 30 kg. per meter weight.

A heating furnace provided with a charging machine furnished by the Wellman-Seaver Engineering Company is used to reheat blooms for this train, the transfer being arranged electrically. All the trains mentioned are commanded by a 40-ton electric crane for changing rolls, repairs, &c., which travels into the machine shop, which in turn is equipped with a 25-ton electric traveling crane, one delivering to the other. The billets are sheared to length in groups of three, and are also delivered to the shipping department by an elevated conveyor operated electrically.

The plans include a fourth train, to be located parallel to the Grey mill. This is to be a 900 mm. mill, to make rails, &c., driven by a 10,000 horse-power three-cylinder engine, with 1300 mm. cylinders and central condensation, built by Ehrhardt & Sehmer, near Saarbruecken. The steam pressure will be 10 atmospheres. Beyond are to be placed a 450 mm. and a 550 mm. mill for bars, smaller shapes, &c.

One of the older French companies, the Société Anonyme de Vezin-Aulnoye, with headquarters at Maubeuge, is putting up a

Steel Plant at Homecourt.

The company now have blast furnaces at Maxeville, near Nancy, and at Aulnoye-ley-Berlaimont (Nord), and rolling mills at Haumont and Tilleul, Maubeuge. The new plant at Homecourt is close to Joeuf, near the German frontier, and promises to become one of the model works of France. An enormous amount of excavation and filling has been necessary to prepare the site, the principal shaft being located in the mill yards. A series of levels have been created so that the molten iron is delivered direct into the mixers.

The plans include six blast furnaces of 27 m. hight, with a daily capacity of 200 tons, two furnaces being now under construction, with their four Cowper stoves grouped in lines. The furnaces will be equipped with the Brown Hoisting & Conveying Company's inclines and automatic charging machines and an elaborate system of bins for stock has been provided. The furnaces are blown with two steam blowing engines supplied by the Société la Meuse, and one gas driven engine from the Cockerill shops. The furnaces lie 16 m. above the steel works level, the iron being poured into two 160-ton mixers, from which the iron goes by elevated road to the basic Bessemer plant. Two 3.5 m. cupolas are provided, operated by Encko blowers. There are 60 large Cornwall boilers of 100 sq. m. heating surface each, a part of them having been built by Piedboeuf of Jemeppues, and a part by Fives Lille. Apparently, therefore, the Vezin-Aulnoye management do not care to rely too much upon gas, but will start with steam power. The boilers carry 10 atmospheres pressure, and a Weiss central condensation system is provided for.

The basic Bessemer steel plant has four 15 to 18 ton converters 3.2 m. in diameter, two cupolas being provided for melting spiegel. The converters have a hydraulic bottom changing apparatus. The converter building is under roof, and the converter stands are in place. The dolomite plant is to be housed in a building 68 m. long and will contain two dolomite calciners, 3.20 m. in diameter, with two mills, furnished by Marie of Charleroi, the material dropping either to a mixing mill or to a chili mill. The bottoms are to be rammed by a Versen machine, while the basic lining brick will be manufactured in a 500-ton press of the Laies system, built at Trier. There will be four single bottom burning furnaces and one long calcining furnace.

The steel is to be cast into a car ladle, the casting house being in a line with the converters. There is a casting pit for casting slabs up to 3 tons in weight, while the ordinary ingots are cast on cars and are handled by a 20-ton traveling crane. Three electric locomotives will take care of the yard service.

The ingots will be stripped by a double stripper of the Aiken type, and will be transferred to heated pits of the Thuillier design. The blooming mill building, for which the foundations are just completed, will be 220 m. long with 70 m. span. The blooming mill, to be built by Delattre, will have 1100 mm. rolls, 2750 mm. long, the engine to be furnished by Sack & Kiesselbach of Raht. The main 850 mm. reversing three-high mill will have four stands, and will be used for rolling beams, girder rails and billets. It is to be driven by a three-cylinder Ehrhardt & Sehmer engine, to be operated as a compound engine when the train is on billets. Between the blooming and the 850 mm. finishing trains there will be interposed gas heating furnaces of the Thuillier design when it becomes necessary to roll smaller sizes of beams. The plans include the putting down of a plate mill and a 700 mm. mill. Two 20-ton Poetter open hearth furnaces with electric charging machines are also to be installed. For handling the rolled product in the yards there are to be two Brown cranes of 80 m. span.

Work has begun on the foundry plant, which is housed in a building 60 m. long, with a center bay of 50 m. span and side bays of 10 m., the center span being controlled by a 40-ton crane and the side bays by 20-ton cranes.

On the bank of the Orne River there are being installed five alternating current electric pumps, to be furnished by the Allgemeine Elektrizitaets Gesellschaft for cooling and other purposes. Power is to be supplied by four blast furnace gas engines of the Otto type, each engine being 600 horse-power. A plant of five gas producers is to be put in to furnish the necessary gas in the case that the blast furnaces are stopped.

The whole plant and its equipment is laid out on a very fine scale. It is backed by the possession of ore concessions in the immediate vicinity, aggregating 1700 hectares. A large number of workmen's buildings, an imposing hospital, &c., are completed.

The plant when in full operation will probably be able to produce about 1200 tons daily of rolled products.

The Compagnie des Forges de Chatillon, Commentry et Neuves-Maisons, one of the famous French works, is working on a large new plant in the Nancy district, at Neuves-Maisons. Two old blast furnaces at that point are to be remodeled at an early date, so that each of the

w furnaces will produce 40,000 tons of basic Bessemer g annually. A third blast furnace has been built and fourth and fifth are being installed, to have the same early output.

Three basic Bessemer converters, of a capacity of 15 18 tons, are being erected, with provision for a fourth. The plan is to roll billets, beams and shapes, rails and es, the quantity involved at first being 100,000 to 110,- 00 tons of finished goods. Arrangements are being ade to go considerably beyond that figure. At the out- et there will be a reversing 1150 mm. blooming mill, a 50 mm. three-stand reversing finishing train and one 50 mm. finishing train. Later on a second 750 mm. rain is to be put up, and then a 950 mm. four-stand eversing train is to be erected, capable of rolling beams p to 500 mm.

The older steel plants of the French Minette district do not, of course, possess the capacity or the equipment of the newer works. The Joeuf works of the De Wendels is able to convert about 500 tons per day, rolling billets, rails, beams and wire rods. The plant is reported to be antiquated and suffers besides from a curious drawback. The raw material, the ore and coke are mined and purchased in Germany, with whose railroad system the plant at Joeuf, in France, has direct railroad connections through a private line. Neither the German nor the French Governments will, for military reasons, allow the connection to be made with the French railroad system, so that all the products of the mill, being practically barred out of Germany by the tariff, must be hauled several miles by axle to the French railroad station at Homecourt, ox carts, horse teams and traction engines being employed in the service, a somewhat unique position for a large steel plant to be in. The Schneider firm, at Creusot, are interested in the works.

The two plants in the Longwy district are of moderate capacity. The Longwy Company's works turned out in 1899 186,463 tons of pig iron and 158,910 tons of ingots. It is stated that this concern is owned by a syndicate of the furnace companies of the district, who seem to work together very closely.

The second steel plant of the district, that of Micheville, made in 1899 172,138 tons of pig iron and 156,989 tons of ingots.

The Dudelange Steel Works are controlled by the Metz family, who were the first to obtain a license under the Thomas-Gilchrist basic patent, and who were also the pioneers of the blast furnace industry of Luxemburg. The Dudelange plant has six blast furnaces and six small converters, and rolls annually about 230,000 tons of billets, rails, shapes, &c. There are just being completed two Otto-Deutz gas blowing engines of 1000 horse-power each and two gas engines to drive dynamos of 500 horse-power each. This plant of 3000 horse-power is to be duplicated at once.

The ores of the Nancy district are not such that they can be mixed so as to be self fluxing and moderate quantities of limestone must be charged. C. K.

Pacific Coast Trade Prospects.

SAN FRANCISCO, July 2, 1900.—This is usually a dull time for trade, and the closing weeks of the month of June have formed no exception to the general rule. We have, of course, been all intensely interested in the history making now going on in the domains of our near neighbor, China, and this and the excitement in the wheat market have furnished abundant room for comment. The advance in wheat comes most opportunely for our Pacific Coast farmers, especially for those of California. All or nearly all sections of the coast have been blessed with abundant crops, and in this State we carry over a heavy stock of wheat from last year. The farmers held it looking for a rise, which has come at last. Our agriculturists will feel rich this year and trade will benefit accordingly. For the six months just closed clearing house exchanges have been $482,088,440.72, and for the same time in 1899, $443,406,306.51, an increase of nearly $39,000,000. The fall is always the best part of the year for business, and unless something untoward should occur the clearings of the present year in San Francisco will exceed $1,000,000,000.

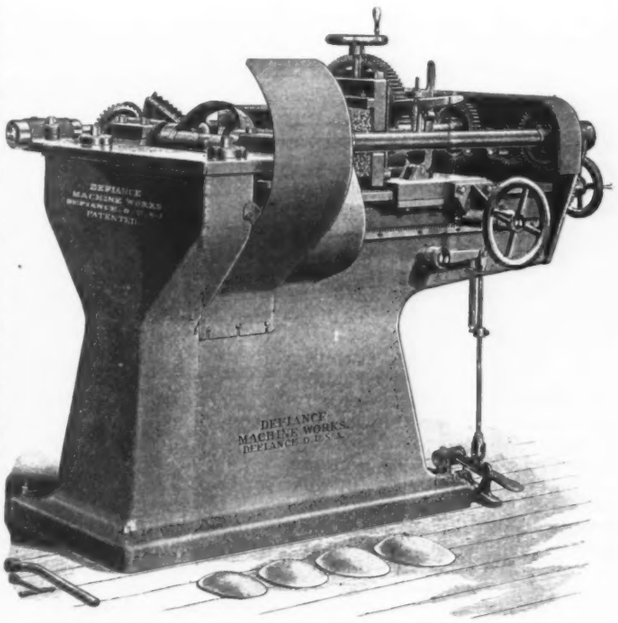
Pig iron seems to hold its own very well in San Francisco as far as price is concerned. At present American is quotable at $30 for Alabama, while English is quotable at $35. Imports have been heavy, 5000 tons having arrived here from Chinese and Japanese ports during the half year. This is American iron that had been shipped there as ballast on cruisers, &c. It has sold ex-ship at $26.50 to $28.50 of late. Compared with Eastern prices, cost of freight, &c., pig iron has been selling here at a discount right along, and our San Francisco foundrymen have had the advantage of it. They use as much scrap as they do pig, and the result is that at present stocks are very large, both in consumers' and first hands. Very little pig iron has arrived here by rail lately. Many of the foundries and large iron working institutions have been working night and day, and some claim to have sufficient work ahead for a year. For this reason a couple of molders' strikes for about 50 cents a day higher wages have been successful with very little effort on the part of the men and, so to say, no friction at all. A single consultation between employers and employed sufficed to settle the slight trouble in both cases. As a rule there has been a very good feeling in the foundry business between employers and employed for the past five or six years. Then it was mutually recognized that arbitration was the only way to settle business misunderstandings, so there is no prospect of any such labor troubles on the Pacific Coast as have proved so calamitous in Eastern cities.

Imports by sea of late have been of moderate volume. The "Peru," from Panama, had 6956 packages of hardware, iron and steel, pipe, horseshoes, &c. The "Crown of India" had 350 tons of English pig iron. Imports of hardware, &c., by rail have been of moderate dimensions. There are at present good stocks of almost everything in this line in the various jobbing centers of the coast.

J. O. L.

The Defiance Wood Dish Machine.

The peculiar feature in the oval wood dish machine built by the Defiance Machine Works of Defiance, Ohio, is found in the three knives which perform the actual



THE DEFIANCE WOOD DISH MACHINE.

work. One is a revolving circular knife for cutting the dish by a single continuous cut, while the other two are facing knives for shaving off the surface of the block between each cut of the first, thereby making the dish with straight edges and uniform as to size. The carriage which supports the wood block is thoroughly gibbed to the main frame and fitted with a powerful chuck for gripping and securely holding the block while being operated upon. It is opened and closed by hand wheel and screw to receive blocks of different sizes. A screw fitted through the frame connects with the carriage to a quick opening and closing nut to engage or disengage the feed When the nut is opened the carriage can be moved horizontally in either direction by rack and pinion motion, which is used for saving time in moving it forward when commencing the cut, or moving it back after the last dish has been cut ready for the next block. The screw feed is driven by cut gears and is automatic. After the block has been placed in the chuck the carriage is fed forward by hand wheel to where the cutting begins, when the nut is engaged with the screw by a convenient hand lever. Instantly the block is fed forward, when each revolution of the cutters produces a dish, and so continues until the block has been entirely consumed. When the last dish has been cut the nut is automatically opened and the feed arrested, at which time the operator is free to move the carriage back ready for the next block. The feed can be adjusted to cut dishes of different thickness, and it can be stopped at any point while the machine is in motion by simply lifting the feed pawl. The machine will make 75,000 dishes per day of ten hours, cutting about 25 to the inch.

The American Bridge Company.

The American Bridge Company have issued the following circular letter to the trade: "As a result of numerous conferences it has been deemed expedient to organize the American Bridge Company, incorporated for the purpose of designing, building and erecting bridges and all classes of metallic structures. The facilities at our disposal are such that we have every confidence that we shall be able to give you the advantage of very favorable quotations, and at the same time be enabled to avoid delays in delivery, which in the past have proved so vexatious in many instances. We solicit your inquiries, which shall have our very best attention.

Accompanying this is a list of the various bridge companies forming the consolidation, as follows:

American Bridge Works, Chicago, Ill.
Berlin Iron Bridge Company, East Berlin, Conn.
Buffalo Bridge & Iron Works, Buffalo, N. Y.
Carnegie Steel Company (Keystone plant), Pittsburgh, Pa.
Edge Moor Bridge Works, Wilmington, Del.
Elmira Bridge Company, Elmira, N. Y.
Gillette-Herzog Mfg. Company, Minneapolis, Minn.
Groton Bridge & Mfg. Company, Groton, N. Y.
Hilton Bridge Construction Company, Albany, N. Y.
Horseheads Bridge Company, Horseheads, N. Y.
Lafayette Bridge Company, Lafayette, Ind.
Lassig Bridge & Iron Works, Chicago, Ill.
Milwaukee Bridge Company, Milwaukee, Wis.
New Columbus Bridge Company, Columbus, Ohio.
New Jersey Steel & Iron Company, Trenton, N. J.
Pittsburgh Bridge Company, Pittsburgh, Pa.
A. &. P. Roberts Company (Pencoyd Iron Works), Pencoyd, Pa.
Post & McCord, Brooklyn, N. Y.
Rochester Bridge & Iron Works, Rochester, N. Y.
Schultz Bridge & Iron Works, Pittsburgh, Pa.
Shiffler Bridge & Iron Company, Pittsburgh, Pa.
Union Bridge Company, Athens, Pa.
Wrought Iron Bridge Company, Canton, Ohio.
Youngstown Bridge Company, Youngstown, Ohio.

This list contains nearly all the leading companies that manufacture bridge and structural work in this country, with the combined capacity of 600,000 tons per annum. The Pencoyd plant of the A. &. P. Roberts Company also comprises one of the best and most complete rolling mills for structural material in existence, with a capacity of 200,000 tons per annum. This puts the American Bridge Company in a position to furnish all classes of bridge and structural work at an absolute minimum of cost, and in the very shortest possible time, and this has already been announced as the future policy of the company. They further say that no advance in prices will be made, but the cost of production will be reduced to an absolute minimum, and judging from the known facilities of the various plants, the facts would seem to justify the statement. The directors of the company are as follows:

Percival Roberts, Jr., of the A. & P. Roberts Company, Pencoyd Iron Works, Pencoyd, Pa.
Alfred C. Case of the Carnegie Steel Company, Pittsburgh, Pa.
William H. McCord of Post & McCord, Brooklyn, N. Y.
Charles M. Jarvis of the Berlin Iron Bridge Company, East Berlin, Conn.
William H. Connell of the Edge Moor Bridge Works, Wilmington, Del.
Walter Hawxhurst of the Elmira Bridge Company, Elmira, N. Y.
Charles Macdonald of the Union Bridge Company, Athens, Pa.
Frank Conger of the Groton Bridge Company, Groton, N. Y.
James P. Kennedy of the Youngstown Bridge Company, Youngstown, Ohio.
Lewis S. Gillette of the Gillette-Herzog Mfg. Company, Minneapolis, Minn.
John F. Alden of the Rochester Bridge & Iron Works, Rochester, N. Y.
Walter G. Oakman of the Guarantee Trust Company, New York.
J. P. Ord of the General Electric Company, Schenectady, N. Y.
Robert Winsor of Kidder, Peabody & Co., Boston, Mass.
Robert Bacon of J. P. Morgan & Co., New York.
Charles Steele of J. P. Morgan & Co., New York.
Paul E. DeFere, 40 Wall street, New York.
Robert S. Green, 1 Montgomery street, Jersey City, N. J.
J. W. Walker of the Shiffler Bridge Company, Pittsburgh, Pa.
Abram S. Hewitt of Cooper, Hewitt & Co., New York.
August Belmont of August Belmont & Co., New York.

The majority of this board are practical bridge men who have in years past made a success of their individual companies. The financial end is unusually strong, being represented by firms and institutions of world wide financial strength, thus forming a combination of practical and successful bridge men, backed by great financial resources.

The following statement has also been issued by the company:

"The executive organization is made up entirely of men of large practical experience, headed by Percival Roberts, Jr., one of the leading rolling mill managers of the country. The Pencoyd plant of the A. & P. Roberts Company, comprising a rolling mill with a capacity of 200,000 tons per annum and one of the most complete bridge and structural plants in the world, has been developed under his personal supervision, and is the result of his energy and ability, eminently fitting him to head an enterprise of this kind.

"Joshua A. Hatfield has been appointed as assistant to the president, and will also have charge of the sales of the rolling mill products of the Pencoyd plant, a position for which his long and favorable connection with the sales department of the rolling mill interests of the country makes him especially adapted.

"The engineering department is in charge of Charles C. Schneider, formerly chief engineer of the Pencoyd Iron Works of the A. & P. Roberts Company, with the title of vice-president, in charge of engineering. Mr. Schneider has full charge of all questions of engineering, including the preparation of all plans, estimates and working drawings, all engineers of the company, whether engaged in the contracting, operating or erecting departments, being under the vice-president in charge of engineering. At different localities throughout the country are stationed designing engineers to prepare preliminary plans and estimates, and at each plant will be located a full and complete corps of engineers and draftsman to prepare plans for the work fabricated at that particular plant.

"The operating department is in charge of Charles M. Jarvis, formerly president of the Berlin Iron Bridge Company, with the title of vice-president in charge of operating. As soon as contracts for any work are taken, they are immediately turned over to this department for execution, and consequently all the plants and erecting forces of the company belong in this department. At each plant is a manager, with full charge over all employees and the operations of that particular plant. Where a number of plants are closely located they are placed under one local manager, each plant being equipped with a superintendent. All managers are under the direct charge of a general manager, James P. Kennedy, formerly president of the Youngstown Bridge Company, who moves about among the various plants in order to see that all are working in one harmonious whole, and that each has the advantage of the experience of every other plant. The erecting is also in charge of the operating department, and this is under William Wennas, as superintendent. Mr. Wennas has had full charge of all the Pencoyd erecting for a number of years, and gained a world wide reputation but a short time ago for the economical and expeditious manner in which he handled the erection of the famous Atbara Bridge.

"All the sales of the company are in charge of the contracting department. This is divided into three distinct parts, namely: Railway contracting, highway contracting and structural contracting.

"The railway contracting is in charge of Charles Macdonald, formerly president of the Union Bridge Company. The highway contracting is in charge of Frank Conger, formerly president of the Groton Bridge & Mfg. Company, and the structural contracting is in charge of W. H. McCord, formerly of Post & McCord. The preparation of all proposals and contracts is in charge of this department. The company have opened contracting offices in different parts of the country, each office reporting daily, by wire, to various members of the contracting department. The contracting department of the American Bridge Company is one of the most important of the divisions, as here are made up the proposals aud estimates on all work, and it might almost be said that on the careful judgment and management of the members of this department depends chiefly the success of the company.

"The mechanical department has been made of equal importance with all other departments, and has been placed in charge of James Christie, formerly mechanical engineer of the Pencoyd plant, with the title of vice-president. The mechanical details of all the various plants belong to this department, and the selection of Mr. Christie as the head insures the American Bridge Company of such mechanical equipment as will guarantee the production of a pound of finished bridge material at the absolute minimum expenditure of power.

"The financial department is in charge of William H. Connell, formerly president of the Edge Moor Bridge Works, as treasurer, with F. M. Wyant, formerly general manager of the Wrought Iron Bridge Company, and F.

H. Schmidt, formerly secretary and treasurer of the Youngstown Bridge Company, as assistant treasurers.

"The auditor of the American Bridge Company is Charles C. Price, formerly with the Pencoyd Iron Works of the A. & P. Roberts Company.

"The purchasing department is in charge of Francis W. Heisler, formerly purchasing agent for the Edge Moor Bridge Works, with headquarters at 259 South Fourth street, Philadelphia, Pa. The assistant purchasing agent is E. A. Muench, formerly purchasing agent for the A. & P. Roberts Company.

"The secretary of the company is Douglas O. Morgan, formerly a member of the law firm of Seward, Guthrie & Steele."

The Langelier Wire Straightening and Cutting Off Machine.

The machine designed by the Langelier Mfg. Company of Providence, R. I., which is here illustrated, is intended for accurately cutting off round wire to any length up to 5 inches, and 3-32 inch diameter in steel and ⅛ inch diameter in brass. The straightening is first done by the ordinary rotary wire straightener as the wire passes into the machine. Feeding the exact length is done by an adjustable crank, which gives motion to the feed slide, and a cam at the pulley end of the shaft operates the cutting head. The action of the machine is best explained by reference to the sectional views of the feed slide and cutter head, Figs. 2 and 3. The feed slide A is made in halves and pressed together by springs, under the screw heads, against the guides B B to cause some tension. As the connecting rod C, actuated by the adjustable crank below, pulls on the grip lever D it presses the dies E with a firm grip on the wire, pulling it the whole length of its stroke. On the return stroke the push of the connecting rod on the grip lever releases the hold of the dies on the wire until the next forward stroke.

The cutting off is done as follows: When the feed slide A is in its most forward position the cam lifts the connecting rod and lever, which is a part of the cutting head G, thus cutting off the wire at H, and at the same time closing the gripping dies I by the movement of the lever J and its rollers onto the spring plunger K, the cam maintaining this grip during the whole of the return stroke of the feed slide, thereby preventing the wire from moving back any, thus assuring absolute uniformity in the length of the wire cut off.

The cutters are simply hardened steel bushings which fit the wire and can easily be sharpened by grinding off squares on their faces at H. The moving cutter in the cutter head is held in place by the screw L and the fixed one held in contact with it by the set screw M. When both the screws are slackened the cutters can readily be pushed out and exchanged for another size. The dies in the feed slide can easily be changed by removing the round plug held by two small screws, clearly shown in the front view of the machine, Fig. 1. The screw F, with two pairs of lock nuts, is provided so that if, in course of time, the play due to wear in the various connections between the crank and the feed slide causes some variation in the length of the feed, it may be corrected by setting the lock nuts so that the feed slide strikes them at each end of its stroke.

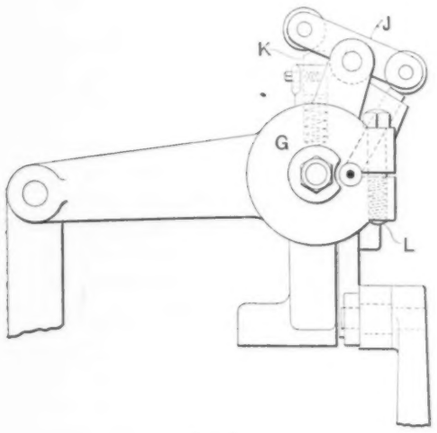


Fig. 2

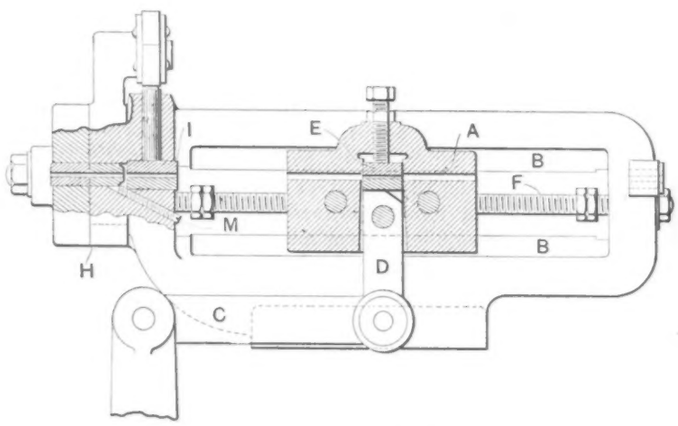
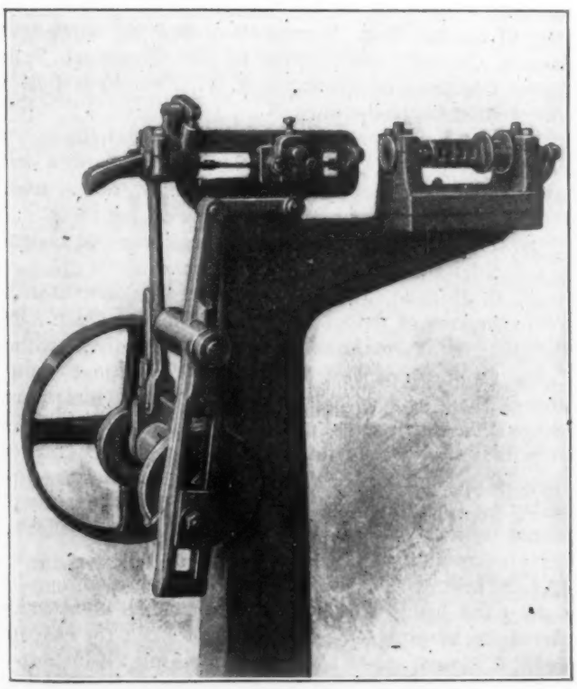


Fig. 3.

Sectional Elevations of Feed Slide and Cutter Head



THE LANGELIER WIRE STRAIGHTENING AND CUTTING OFF MACHINE.

An engraved invitation has been received from the president and directors of the Cleveland Cliffs Iron Company to attend the celebration of the fiftieth anniversary of the Cleveland Iron Mining Company, at Ishpeming, Mich., on Saturday, 14th inst. The incorporators in 1850, as stated in the invitation, were Samuel L. Mather, M. L. Hewitt, C. D. Brayton, John Outhwaite, John W. Allen, Isaac L. Hewitt. The present directors are Wm. G. Mather, J. H. Wade, E. R. Perkins, Samuel Mather, J. H. McBride, Samuel E. Williamson, W. S. Tyler, J. H. Hoyt, Peter White. The place of assembly on the day named will be on the site of the company's original mine, marked by a flag. The programme is as follows: 10 a.m., prayer, by the Rt. Rev. G. Mott Williams, D.D., Bishop of Marquette; music; singing; historical address, by Hon. Peter White of Marquette, Mich.; music, band; reception to employees, 12 to 1.30 p.m.

Corrigan, McKinney & Co., operating Charlotte furnace, at Scottdale, Pa., have completed and put in operation two new hot blast stoves, each 19 x 75 feet. Another blowing engine has also been added to the equipment. These improvements are expected to bring the output up to 200 tons per day.

Bellefonte Furnace of the Bellefonte Furnace Company, Bellefonte, Pa., was blown out June 24 for relining, repairs and improvements, which will require about two months to complete. The changes to be made are expected to increase the capacity of the furnace from 25 to 33 per cent.

The Vincennes Machinery Exhibit.

EDITORIAL CORRESPONDENCE.

PARIS, June 17, 1900.—What is probably as fine a collection of typical American machine tools and appliances as has ever been gathered together in an exhibition is now practically in full working order at the Vincennes annex to the Paris Exposition. The impression produced upon the visitor by the aspect of the Vincennes annex is complex. The grounds present a somewhat forlorn appearance and have the look of being neglected to some extent. There is not that neatness which characterizes the main exposition, although the outdoor exhibits themselves, chiefly railroad tracks and cognate displays, are spic and span.

Opinion as to the desirability of the location for the American machinery show appears to differ considerably among those who are represented. Some feel that the whole department has been sidetracked and that fear of the competition of American makers had something to do with it. Others are rather inclined to congratulate themselves, claiming that they are not interfered with by the idly curious who flock about and linger long gaping wherever any machinery is in motion. That, of course, is characteristic of all exposition crowds, and its effect is observed in the main buildings in the Champ de Mars and in the Invalides section under similar circumstances. It is certain that only those go out to Vincennes who are really serious in their desire to study American machine tools and their work, and your correspondent was himself a witness of a little scene which confirms this. Two foreigners, after having looked at some machinery at the Champ de Mars, made inquiries about the best means of reaching Vincennes and promptly started.

Still it does seem a pity that it was impossible to secure adequate space near the main building as the Germans did. As it is, the great majority of American firms who exhibit at Vincennes, their machinery in motion doing actual work, also have space in the principal machinery section at the Champ de Mars. These duplicate installations have some advantages, since the show at the Champ de Mars is an advertisement for the display of the more important Vincennes installation. But this means considerably enhanced first cost and greater expense of representation, and at the same time lessened efficiency in the work of explaining and recommending the tools to visitors. It is not, under any circumstances, an easy matter to secure a proper person to present the merits of an exhibit. The combination of a polyglot and a mechanic is a rare one, and it becomes troublesome when he must swing from one installation to another many miles away.

In a number of cases, the large machinery dealers who handle American tools in France or on the Continent generally have what might be called collective displays, a method which to the individual constituent firm has some advantages and some drawbacks.

At first the American machinery exhibitors were quite generally agreed that the direct benefits from the enterprise displayed in coming to Paris were rather slim, and the outlook for remunerative results was pronounced unsatisfactory. Lately, however, the reports are very much more encouraging. Quite a number report good sales and note serious inquiries.

The steel building used for the Vincennes annex is in itself an exhibit of the Berlin Iron Bridge Company of East Berlin, Conn., by whom it was erected. The material is of American manufacture, all the work on which was done at the company's shops, then shipped here and erected in eight days by 14 American workmen. It is equipped with a 30-ton Shaw electric traveling crane, exhibited by Manning, Maxwell & Moore of New York.

Advancing through the building we meet on the right hand the space allotted to the Jones & Lamson Machine Company of Springfield, Vt., who show their widely known turret lathe, their neighbors being the indentified interest, the Fellows Gear Shaper Company of the same town, with a 36-inch gear shaper. Opposite, the M. C. Bullock Mfg. Company of Chicago display various sizes of diamond core drills, they in turn being flanked by the Vacuum Oil Company of New York, with a series of lubricating oils.

The Q & C Company of Chicago have effectively shown their specialties. In one case is a section of a pneumatic hammer with parts of hammers, riveters and calking tools. They display hack saws, an automatic saw grinder, pneumatic tube expanders, two sizes of pneumatic drills, electrically driven cold saws for beams and shapes, and air hoists which are equipped with a special device to prevent lowering from leakage or through accident. The adjoining space is occupied by the R. K. Blond Machine Tool Company of Cincinnati with their lathes, the agents being H. Glaenzer & Perreaud of Paris. Next on the right hand side of the aisle is the Victoria gear cutter, built by Gould & Eberhardt of Newark, N. J.

The Rand Drill Company of New York have an extensive collection of machines, among them being rock drills of different types and one large compound air compressor. Two smaller air compresors are shown, to be driven by Pelton wheels. Opposite is the space occupied by the Ingersoll-Sergeant Drill Company of New York, with a compound two stage air compressor, with 12 and 22 inch steam cylinders, 10¼ and 16¼ inch air cylinders and 30-inch stroke. There is besides, in place and running, a 14 x 18 inch air compressor, a 7-inch track channeler and a series of rock drills.

The Jeffrey Mfg. Company of Columbus, Ohio, show one of their 10 D compressed air chain coal cutting machine and an electrically driven coal cutter. They display electric and compressed air drills and a well arranged collection of elevator buckets, link chains, conveyors and other handling appliances. Close by is a Wheeler surface condenser, exhibited by the Wheeler Condenser & Engineering Company.

The boiler room for the total plant is located in this part of the building. It consists of two 250 horse-power Morrin Climax boilers, built by the Clonbrock Steam Boiler Company of Brooklyn, N. Y. Near by a Ball engine is just being installed.

Next along the main aisle to the right is the display of Warner & Swasey of Cleveland, who show a lathe with roller feed and interchangeable bushings, and a representative line of modern brass working tools.

To the left of the main aisle a large space is assigned to the Niles-Bement-Pond aggregation.

E. P. Bullard, Jr., represents the Bullard Machine Tool Company of Bridgeport, Conn.; the Hendey Machine Company of Torrington, Conn., and Prentice Brothers Company of Worcester, Mass. The first named show a line of their boring and turning mills and their turret lathes. The largest tool is a 62-inch mill which has been at work on some Creusot tires for a French railroad shop. The engineers of the latter specified that the work of boring on one tire was to be done in one hour. The actual time taken was 10 minutes, under somewhat adverse surroundings. Among the other tools shown is a 42-inch mill with a screw cutting attachment on the right hand head, a 37-inch mill, a 22-inch combination turret machine with a complete head stock for cast iron work, a 22-inch screw machine for taking 2¾-inch stock and a 30-inch turret head boring machine. All these are standard tools and were taken from stock. A number of jobs have been taken, to be put through with the tools, and additional work for them is being secured.

The Hendey Machine Company show a 12-inch lathe with taper attachment, and a 16-inch Hendey-Norton lathe so arranged that the tail stock may be taken off and a turret be put on and the lathe be used also as a turret lathe. This is quite often done abroad, while little known at home. Another Hendey-Norton lathe has the relieving attachment, while a 20-inch lathe, with the regular cross slide, is equipped with a turret on the cross slide. All of these tools are fitted with millimeter

screws. The other tools shown are a 14-inch and a 28-inch Hendey shaper.

The exhibit of Prentice Bros. Company of Worcester, Mass., consists of a 16-inch and a 24-inch lathe, a 5-foot radial drill and a 20-inch wheel and lever drill, a 24-inch back geared drill, and a three-spindle sensitive drill, all of them being standard machines.

The Brown & Sharpe Mfg. Company of Providence, R. I., occupy a large space and are cleverly represented. Prominent among the tools exhibited is what is known as No. 13 automatic gear cutting machine for cutting spur and bevel gears, which embodies a number of new features recently patented. Another is the No. 6 automatic gear cutting machine, in which the indexing mechanism is independent of the feed and of the speed of the cutter, so that the indexing is as rapid when these are slow as when they are fast. The No. 4 gear cutting machine has an attachment for cutting internal gears, which is also applied to others.

One of the surface grinding machines displayed is fitted with a magnetic clutch by A. S. Walker Company of Worcester, Mass., whose demagnetizer is also in use. The plain grinding machine No. 14, with automatic feed, is fitted with an arrangement for grinding to taper to 2 inches per foot. The universal grinding machine No. 3 has a new positive automatic cross feed which gives a range of feed varying from 0.00025 inch to 0.004 inch to each reversal of the table. The No. 2 plain milling machine has a new arrangement for feeding slowly. A very interesting tool shown in the space is the first universal milling machine built by the firm 40 years ago. It was acquired from the original purchaser recently, and embodies the main principles still underlying the design. The Brown & Sharpe No. 5 vertical spindle milling machine has undergone some changes. A silent chain, made by Hands-Reynold of Manchester, has taken the place of the belt, and an attachment is provided for circular milling. A new slotting attachment is also shown. A new automatic screw machine is attracting a good deal of attention. It is so designed that a bell rings when the supply of stock is exhausted. One boy can attend to six to seven machines. The Brown & Sharpe Mfg. Company exhibit a series of combinations of gearing and show their measuring machine. In eight large showcases they display their famous line of small tools, &c.

Opposite, on the main aisle, is the collective exhibit of machinery represented by Markt & Co.

Close by them is the Standard Pneumatic Tool Company of Chicago, with the Little Giant tools.

The Brainard Milling Machine Company of Hyde Park, Mass, show the No. 2½, No. 3 and No. 5 B Becker millers.

Advancing along the main aisle, we meet on the left the well-known milling machine of the Ingersoll Milling Machine Company of Rockford, Ill., while on the right is an admirable display of mechanics' tools by the L. S. Starrett Company of Athol, Mass. In the same group are the grinding machinery of the Builders Iron Foundry of Providence, R. I., and Washburn shops of the Worcester Institute, Worcester, Mass. The Norton Emery Wheel Company of Worcester, Mass., make a very effective showing of their emery wheels, while opposite is the machinery of the Acme Machine Company of Cleveland, Ohio. They have installed a forging machine, a triple and a single bolt cutter and a nut tapping machine.

The Ferracute Machine Company of Bridgeton, N. J., have a series of presses in running operation. One of them is a large double acting drawing press used chiefly for making agricultural machine seats and like articles; a screw press, a deep throat press, a long stroke drawing press, a small punching press, with dial feed, and a large cutting machine for armature disks and heavy sheet metal work, with a special automatic friction clutch, which stops of itself at the top of the stroke.

The Landis Tool Company of Waynesboro, Pa., show grinding machinery.

The Cincinnati Milling Machine Company of Cincinnati have placed in their space their well-known universal milling machines, No. 1, No. 2 and No. 3.

In a lean-to a considerable number of additional exhibits have been installed. Among them are the H. B. Smith Company of Smithville, N. J., with a series of wood working machines, and the E. W. Bliss Company of Brooklyn, N. Y.

The principal installation in the annex is that of the Indo-Egyptian Compress Company of Boston and New York. Installed near them are a hoisting engine by J. S. Mundy of Newark, N. J.; Colburn keyway cutters, by Baker Brothers of Toledo, Ohio; samples of work made by Colburn's universal saw bench, tools from the Bickford Drill & Tool Company, and the machine of the Rice Gear Company of Hartford, Conn., described exhaustively in the columns of *The Iron Age*. The Doig box making machine is shown, as also are axe presses from the Mossberg & Granville Mfg. Company and vises from the Prentiss Vise Company. In the same group are products from the Safety Emery Wheel Company of Springfield, Ohio; drills from A. D. Quint of Hartford, Conn., and machinery from the Morton Mfg Company of Muskegon Heights, Mich.; the Springfield Machine Tool Company of Springfield, Ohio, and the Springfield Mfg. Company of Bridgeport, Conn.

Fenwick Frères of Paris represent F. E. Reed Company of Worcester, Mass.; W. F. & John Barnes Company of Rockford, Ill., and the Fosdick & Halloway Machine Tool Company of Cincinnati, Ohio.

A large number of these exhibits are practically duplicated in the main machinery hall at the Champ de Mars, among the firms thus having a second exhibit being W. F. & John Barnes Company of Rockford, Ill.; Warner & Swasey of Cleveland, Ohio; the Niles-Bement-Pond Company, F. E. Reed & Co. of Worcester, Mass.; Pratt & Whitney Company, Brown & Sharpe Mfg. Company, Bullard Machine Tool Company, Norton Emery Wheel Company of Worcester, Gould & Eberhardt of Newark, N. J.; Ingersoll Milling Machine Company, Becker-Brainard Milling Machine Company, Flather & Co. of Nashua, American Machinery Company of Grand Rapids, Mich.; Markt & Co. of New York, Doig Box Nailing Machine Company, American Tool & Machine Company of Boston, Jones & Lamson Machine Company and Fellows Gear Shaper Company of Springfield, Vt.; Q & C Company, Chicago; Cincinnati Milling Machine Company, Standard Pneumatic Company, E. W. Bliss Company of Brooklyn, N. Y.; Ferracute Machine Company of Bridgeton, N. J., and others.

Tinius Olsen & Co. of Philadelphia display an automatic cement testing machine which has some interesting novel features; a new oil testing machine, of which one has been sold to the Portsmouth Navy Yard, and a torsion machine for testing full sized shafting. All of these machines are arranged for the metric system.

The Batcheller Pneumatic Tube Company of New York have an installation of their system, but do not appear to be operating it. Near by is the space allotted to the General Electric Company, who in a model 18 feet long reproduce their different works at Schenectady, N. Y.; Lynn, Mass., and Harrison, N. J. The model, being lighted from below and above, is very attractive. Large photographs are displayed showing the interiors of some of the plants, and of some of the great installations of dynamos in different power stations in the United States.

In one group, close together, are the displays of the Rider-Ericsson Engine Company, the Thomson Meter Company, the Ashton Valve Company and the Chapman Mfg. Company of Indian Orchard, R. I.

The Morse Twist Drill & Machine Company of New Bedford, Mass., have a particularly handsome display of twist drills and milling cutters. One large gang of spiral milling cutters with side milling cutters with inserted teeth is particularly conspicuous, being 15½ inches long.

The Gleason Tool Company of Rochester, N. Y., show one of their widely known gear planers. E. Horton & Sons Company of Windsor Locks, Conn., make an effective display of lathe chucks of all sizes. Among the exhibitors in this part of the section are the Potter & Johnston Company of Pawtucket, R. I.; Watson & Stillman Company of New York and N. P. Bowsher Company of South Bend, Ind.

An interesting exhibit is that of W. P. Healy of Chicago, of a machine for making wire bound packing boxes. S. R. Dresser of Bradford, Pa., displays his system of laying oil, gas and water pipe lines. A very handsome exhibit of saws is that of E. C. Atkins & Co. of Indianapolis, Ind. The Rockwell-Clough Company of Alton, N. H., have in operation an automatic machine for making screw drivers, which attracts much attention. The Lunkenheimer Company of Cincinnati, Ohio, have displayed in a very effective manner their large range of valves and lubricators.

Facing one another on opposite sides of the aisle are the cases of twist drills, taps, reamers, &c., of the Standard Tool Company of Cleveland, Ohio, and the Cleveland Twist Drill Company of Cleveland, Ohio.

A large space is effectively filled by the J. A. Fay & Egan Company of Cincinnati, Ohio, with wood working machinery. H. Glaenzer & Perreaud, as agents, display the line of products of the American Pulley Company of Philadelphia, whose pressed steel pulleys the readers of *The Iron Age* are thoroughly familiar with; the Direct Separator Company of Syracuse, the Burt Mfg. Company of Akron, Ohio, makers of oil filters; the Nathan Mfg. Company of New York, the Keystone Engine Company of Philadelphia, the Fisher Governor Company of Marshalltown, Iowa, and the Wheeler Condenser & Engineering Company of New York.

The Bullock Electric Mfg. Company of Cincinnati have a handsome display of motors, &c., while the Lorain Steel Company of Lorain, Ohio, show trucks, &c. The Walworth Mfg. Company of Boston, manufacturers of valves, have their handsome case of valves rather unfortunately placed in a dark spot.

The Ferracute Machine Company of Bridgeton, N. J., at the Champ de Mars have a series of lighter tools, among which are a small foot press for jewelers' use and light work generally, and a larger foot press for tin cans for the fruit and sardine trade. A drop press is exhibited for making jewelry and buttons. A cutting press for thin metals for tinware, brass goods, lamp work, &c., has a feed roll attachment making 100 strokes per minute. A cutting press has a special feeding attachment for indexing, being used for notching saws and for cutting armature disks, becoming a universal machine. All ordinary armature notching machines have separate index plates. In the arrangement adopted with this press interchangeable ratchets and pinions make it possible to cut any shape and any number of notches from 3 to 250, and any diameter of disk from 3 to 48 inches. The machine is made with longer beds up to 120 inches in length for very large disks. It is furnished with an individual motor of the Triumph type.

A group of two interesting machines is a double action geared drawing press with the dies for drawing such work as blacking boxes, &c., up to 5 inches in diameter and 1 inch in depth. Connected with it is a deepening press, used for redeepening the articles made by the first named tool. The machines are driven in pairs by a Triumph double ended motor.

A heavy punching press is also shown which is used for making bolts, nuts and washers, for trimming drop forgings and for sewing machine, bicycle and the smaller automobile parts and for hardware articles. With the exception of the tools mentioned as driven by Triumph motors direct, those exhibited are operated through shafting by a Crocker-Wheeler motor.

A neat idea well carried out is a revolving stand on which 300 photographs of machines are displayed. There is also a complete set of samples of articles made, and illustrating the processes of manufacture. C. K.

The Convenience of Lifting Magnets Illustrated.

The Electric Controller & Supply Company, Cleveland, Ohio, make a specialty of the designing and manufacture of the Wellman lifting magnets for handling steel or iron plates, bars, slabs, billets, ingots, &c. We reproduce herewith a number of photographs showing the mag-

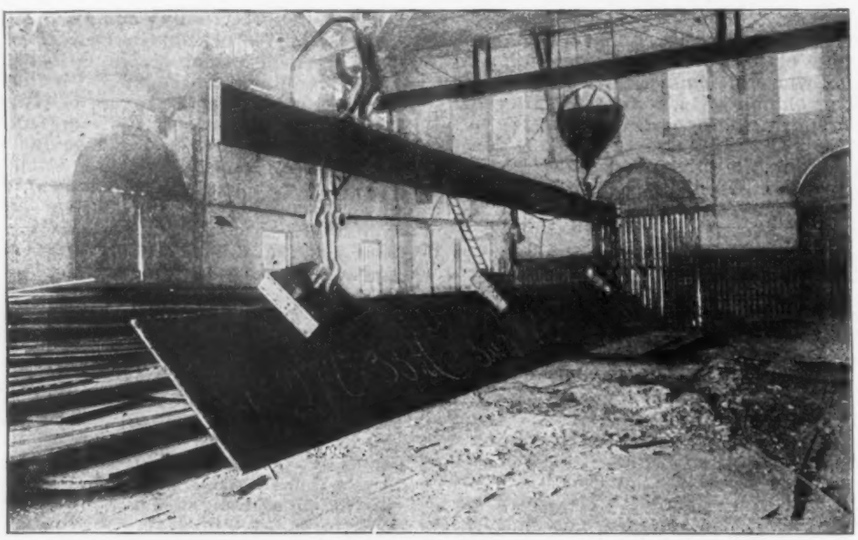


Fig. 1.—Magnets Lifting 3000-Pound Plate from Flat Position, Preparatory to Placing in Rack on Edge.—Dimensions of Plate, 27 Feet 6 Inches by 33 9-16 Inches.

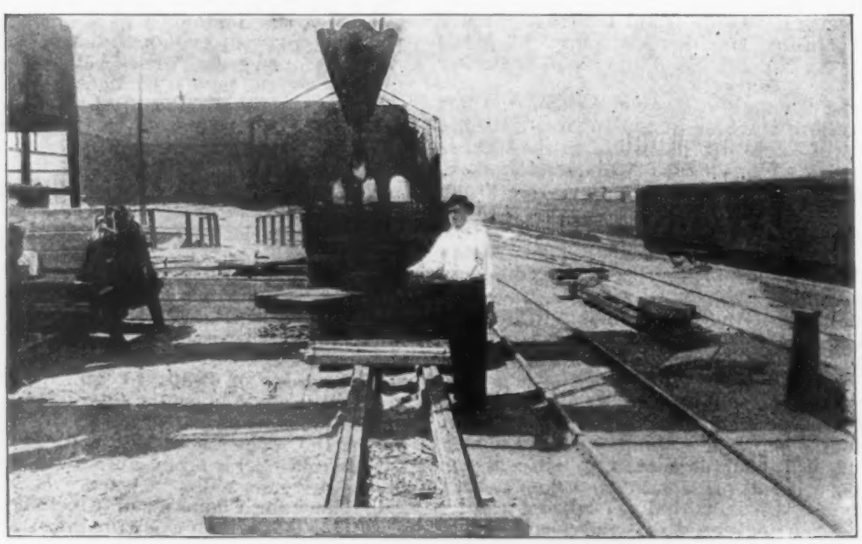


Fig. 2.—Magnet Lifting Five Billets, Each Weighing 240 Pounds.

CONVENIENCE OF LIFTING MAGNETS ILLUSTRATED.

nets in actual operation. The handling of the magnets is exceedingly simple. The magnet is lowered on the material to be lifted, when the current is switched on, the hoist raised, and the plate, slab, billet or whatever it is is lifted with the magnet. When the load has been brought to the required place it is lowered to position, the current shut off and the magnet raised, or the load can be dropped without first lowering the magnet. As will readily be seen, the use of these magnets avoids the necessity of having a gang of men to pry up or block up material to permit the chain being swung around or an ordinary clamp being attached; also the time saved that would be lost in shifting the chain from one position to another, as commonly has to be done where plates are handled with chain, to prevent the chain or hooks slipping off. Thus there is a saving of from three to

four men, and it is claimed the work can be done in half the time. The lifting of plates and boiler heads is illustrated in Figs. 1 and 3.

In handling billets or other material of similar shape two, three, four or even more pieces, Figs. 2 and 4, up to the full length of the magnet, can be picked up and handled simultaneously. In the case of thin plates the current from the magnet will pass through a number of plates, so that several will be lifted at a time; the plates in excess of the number required can be dropped one at a time by switching the current off and on. Also, in handling thin plates or other thin material, such as boiler heads, &c., the pile can be knocked over so that the lifting face of the magnet can come in contact with the edges of the material, lifting a number of them in this way, as shown in Fig. 3. In handling extra long plates two or more magnets can be used to prevent the plate from bending or sagging. Also, the magnets can be so dropped on the plate as to raise it from flat to vertical position, handling it in this position and depositing it on edge in the rack. This method of handling is shown in Fig. 1.

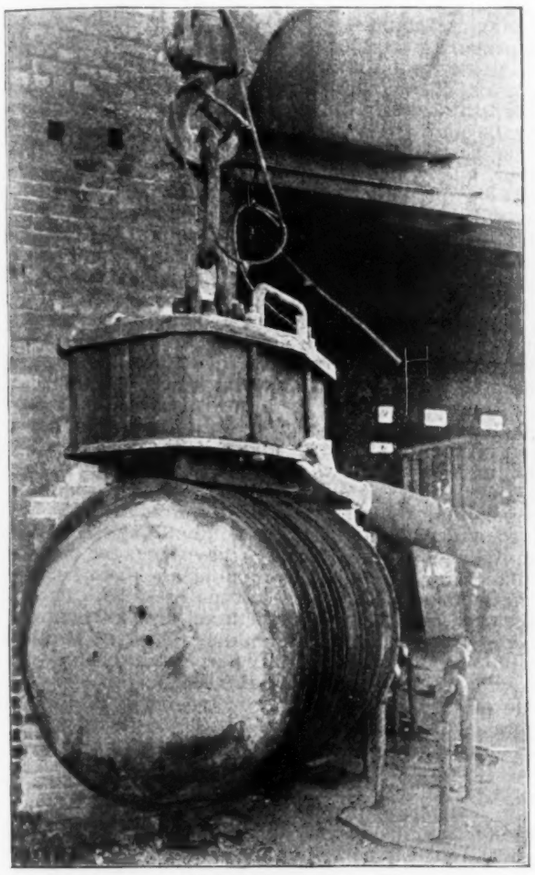


Fig. 3.—Magnet Lifting Boiler Heads.

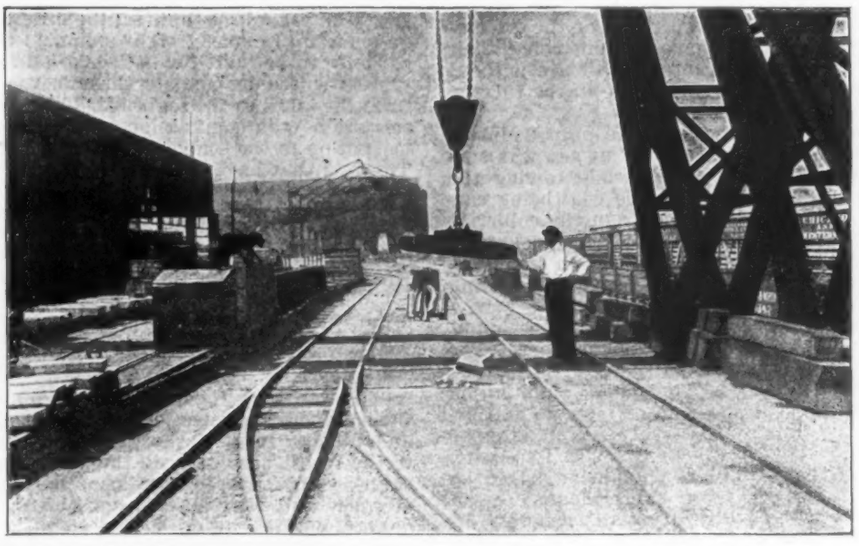


Fig. 4.—Magnet Lifting Six Billets, Each Weighing 730 Pounds.

CONVENIENCE OF LIFTING MAGNETS ILLUSTRATED

The N. O. Nelson Interests at Edwardsville, Ill.

Four companies have filed articles of incorporation at Springfield, Ill., and will absorb the manufacturing plants of the N. O. Nelson Mfg. Company at Edwardsville, Ill., the latter company retiring from the field to confine their energies to the jobbing and plumbers' supply business at Eighth and St. Charles streets, St. Louis. The new corporations are as follows:

The Leclaire Mfg. Company, capital, $50,000.
The Illinois Marble Company, capital, $15,000.
The Edwardsville Brass Company, capital, $45,000.
The Bignall & Keeler Mfg. Company, capital, $50,000.

Each of the new companies will be operated independently, it is stated, disposing of their goods to whom they may see fit, and having no connection with the Nelson Company, who have hitherto disposed of the output of all four of the plants. It is reported that some of them will be extensively enlarged in the near future.

Two large new mills for sawing marble into slabs have recently been added to the plant of the Illinois Marble Company, adding considerably to their output, and it is expected that a bathtub factory will be installed in the plant in the near future. The incorporators are W. J. Held, W. R. Raymond and W. E. Wheeler, Jr.

The Leclaire Mfg. Company will continue to make hard wood mantels, fancy turned work, office and bank fittings, and similar goods. Their incorporators are Charles Nugent, William J. Kennedy and W. E. Wheeler, Jr.

The Edwardsville Brass Company make nearly everything that is cast in brass and the plant has hitherto done an extensive trade. Their incorporators are C. H. Harkins, L. D. Lawnin and W. E. Wheeler, Jr.

The Bignall & Keeler Mfg. Company have heretofore confined their attention to the manufacture of certain patented machines for cutting and fitting iron pipes. It is thought that additions will be made to the plant. The incorporators are Ralph McCarty, William Shaw and L. D. Lawnin. In the case of this plant, the action taken is a reincorporation, as the old charter was surrendered in 1894 when the property was absorbed by the N. O. Nelson Mfg. Company.

In the course of an interview on this subject, N. O. Nelson said to reporter for a local paper:

"Our plant at Edwardsville manufactures four distinct lines of goods, each of which is sold partly through our St. Louis wholesale house and partly to other wholesale houses throughout the country. They have been established as parts of our business for from five to twenty years. We believe that better results can be obtained by having each factory do its own business and get credit for what it accomplishes, and also by giving the opportunity to the managers and workers to become interested in the property and profits of the factory they work in. Our plan for many years has been to interest the operating force, but when the profits

are made jointly by the wholesale house and all the different factories, the interest is very indirect. It is the intention to enlarge the business of each factory by selling more to the wholesale trade. The factories are all of the best standard construction and equipment. They have three side tracks into the premises, a single power house for all, with very cheap fuel, and possess every modern facility."

Naval and Merchant Ship Construction.

The fifth annual edition of the "Blue Book of American Shipping" will shortly be issued by the Marine Review Publishing Company, Cleveland, Ohio. This book is a marine and naval directory of the United States. The following extracts are taken from the introduction to the work:

It is gratifying to observe that the present Congress at its first session has provided for a substantial increase of the navy. The naval bill provides for the construction of two battle ships, three armored cruisers and three protected cruisers. The battle ships are to cost approximately, exclusive of armor and armament, $3,000,000, the armored cruisers $4,000,000 and the protected cruisers $1,141,000 each. In addition there are yet to be laid down three battle ships and three armored cruisers of the largest class, provided for in the act of March, 1899. All of these vessels are exclusive of some 43 now building for the United States Navy in the various coast shipyards. The vessels for which contracts have been let aggregate in price, exclusive of armor and armament, $34,554,410. The programme not yet contracted for will approximate in cost $40,000,000. The one departure, revolutionary in its tendencies, is the purchase of the submarine torpedo boat "Holland" and the authorization of the purchase of five more submarine boats like it from the Holland Submarine Torpedo Boat Company.

With the addition of the new ships lately authorized by Congress the regular United States Navy will consist of 231 vessels. Add to this 84 auxiliary vessels and the total is 315, including all types from the first-class battle ship to the converted tug. Of effective war ships—battle ships, armored and protected cruisers, gunboats, coast defense vessels, torpedo boats and torpedo boat destroyers—the United States has to-day in commission, in course of construction or authorized, 122 ships with a total displacement of 413,525 tons. Germany has 220 ships of 410,805 tons displacement, while France, leading Germany, has 417 ships of 765,519 tons displacement. Great Britain, of course, leads all the navies with 506 vessels of 1,824,920 tons displacement.

The genius for innovation has led the navy to make some daring experiments. Since the last issue of the "Blue Book" the superimposed batteries of the "Kearsarge" have been tested and have demonstrated their ability to deliver a fearful concentration of fire without material shock to the ship or interference in the turrets. Structurally they are successful.

The experiment of coaling the battle ship "Massachusetts" from the collier "Marcellus" at sea was successful. The battle ship was coaled while towing the collier at a rate of 8 miles an hour, the coal being carried in 800-pound bags along a cable from the collier to the battle ship. The experiments in wireless telegraphy demonstrated the feasibility of communication from ship to ship, the range of intelligible messages depending upon the hight of the sprit upon the masthead.

Immense strides have been made in the application of electric driving power for auxiliary machinery. The cautious experiment of electrically driven turret turning machinery on the "Brooklyn," of chain ammunition hoists on the "Puritan," the system of blowers and exhausters on the "Wilmington," have all been grouped on the "Kearsarge" and "Kentucky." These two battle ships have more of their auxiliary machinery driven by electric power than any other war ships afloat.

So much for the navy, which after all is merely designed for the protection of that greater fleet—the merchant marine. The last report of the Commissioner of Navigation shows that the tonnage operating under our coasting laws, 21,397 vessels of 4,015,992 gross tons, is the largest in our history and is greater than the coasting tonnage of any other nation. Our steam tonnage, 2,476,011 tons, for the first time exceeds the tonnage of all other craft. In the rest of the world steam tonnage 11 years ago exceeded said tonnage. It is a pity that there is nothing encouraging to report of our foreign going tonnage. Last year American vessels carried a fraction less than 9 per cent. of our exports and imports, the smallest percentage ever carried by them. It is quite clear that the American merchant marine cannot flourish in the foreign carrying trade against the financial encouragement given to the merchant marine of other nations.

The development in iron and steel shipbuilding continues with unabated energy. New shipyards are springing up along the Atlantic and Pacific coasts. The New York Ship Building Company are building a new plant at Camden, N. J., which will be one of the largest in the country. Work is being rushed and the company expect to bid for the new battle ships and cruisers to be built by the United States Navy. Ship construction will be begun there some time during the present year. At New London, Conn., the Eastern Ship Building Company are erecting an immense plant. The works of this company are primarily established to build two cargo carriers for the Pacific trade for James J. Hill of the Great Northern Railway. These carriers will be of 34,000 tons and will exceed in size anything afloat. Something of their size may be appreciated when it is said that they will be bigger than the "Lucania" and "Campania" put together, and will have about 5 acres of deck space. As profit earning capacity and not speed is the end sought, they will be slow boats, designed for moderate coal consumption. The Wm. R. Trigg Company of Richmond, Va., are adding extensively to their plant, being now engaged in an outlay of $800,000 in improvements. The new equipment will make it one of the largest shipbuilding plants on the Atlantic Coast. The Fore River Engine Company of Weymouth, Mass., one of the latest in the field, have grown so rapidly that they have just purchased 60 acres of land at Quincy Point, Mass., 2 miles from their present site, for a new plant. The Cramps at Philadelphia have extended their works by the purchase of an adjoining shipyard, and the Newport News Company, at Newport News, Va., are just completing a very large dry dock and other additions to their plant.

Since the opening of Alaska the Pacific Coast has received a decided impetus in shipbuilding. The Risdon Iron Works of San Francisco have engaged in general shipbuilding. They are equipping a plant of sufficient capacity to build the largest type of ships. The Wolff & Zwicker Iron Works of Portland, Ore., are contemplating the erection of a shipbuilding plant at St. John's. At the Union Iron Works, San Francisco, additions and improvements of considerable importance have been made of late, and the same is true in a proportionate degree of the smaller works.

The approximate value of vessels built in shipyards of the great lakes during the past year is $10,500,000. Nearly all of these vessels are steel freight steamers of 450 to 500 feet in length and of 7000 to 8000 net tons capacity, equipped with quadruple expansion engines of 1800 to 3000 horse-power, and in most cases with water tube boilers. The year has, of course, been one of the most prosperous in the history of lake shipbuilding, on account of the boom in iron and steel lines. There are still a large number of ships under construction in the lake yards. If the number of new ships ordered for lake trade should be limited, the difference will probably be made up in steel freight steamers of about 3000 tons capacity to be built for both lake and Atlantic service—vessels suited to passage through the Canadian canals from the lakes to the seaboard. About a dozen such vessels are now in commission on the lakes and they might be sent on to the seaboard for coast service at any time. The few that have gone to the Atlantic have proved so successful in trade to Porto Rico and down the United States coast that it is proposed to equip four others, now under construction at the works of the American Ship Building Company, for all kinds of service on salt water as well as on the lakes. Companies are forming for the construction and operation of a very large fleet of steamers of this kind and it is expected that the lake builders will profit largely on this score.

The Salisbury Carbonate Iron Company, Chapinville, Conn., operating charcoal blast furnaces at Chatham and Copake Iron Works, New York, state that, owing to the forest fires early in the spring, much of the wood to be manufactured into charcoal for them was destroyed, and they have been obliged to let their Copake plant lie idle on that account. They now have, however, sufficient wood in hand, so that they hope to start the Copake Iron Works within the next two weeks, and then both furnaces will continue to run on as usual. They have many orders for their superior quality of carbonate metal, for Government and other special work, running over several months, which are pressing them very hard every day, showing that there is no lack in that class of work.

Because of the large size of the steel cars sent to the Paris Exposition by the Pressed Steel Car Company of Pittsburgh they could not be handled by French railways on their own wheels direct to the exposition grounds as planned, and they had to be loaded on barges on the Seine, taken to Vincennes and then hauled by wagon to Paris. The Pressed Steel Car Company have one of the most interesting exhibitions at the Paris Exposition.

Australasian News.

New Zealand Iron Sand.

MELBOURNE, May 22, 1900.—According to *The Iron Age* of April 5, the difficulties in regard to the successful working of New Zealand iron sand appear to have been overcome. [This statement was taken from an English exchange.—Editor *The Iron Age.*] The presence of titanium appears to have been one of the chief difficulties that local experimenters have had to contend against, although the New Zealand patent office has been bombarded, from time to time, with specifications of processes for smelting the iron sand. There have been plenty of enthusiastic experimenters, though I have not yet heard of any one who has succeeded in transforming the deposits into merchantable plates and bars.

While at the moment lacking any definite assertion that no one has succeeded, it is fairly safe to infer, for that very reason, that the problem has not been locally solved, or the fact would have been blazoned throughout the Australasian mercantile world.

One company at least, the Onehunga Iron Works, have carried on experiments for some considerable time, but without success, and the company now have ceased to exist, and the plant is for sale.

This black iron sand, which is found in abundance in the Taranaki district of New Zealand (North Island), has attracted the attention of dozens of experimenters, and leases of the areas have been granted from time to time to different experimental enthusiasts. Edison himself has applied for patents for working it, and attempts have been made to float companies in London to work other patents. Rumor has also frequently handled such names as Siemens in connection with iron sand schemes.

A local patent which attracted attention some time ago provided for the chief difficulty of getting the sand into a shape that would enable it to be kept long enough under the heat of the furnace, by the mixture of glass briquettes, although one would imagine that the glass would melt too quickly for the iron sand to fuse.

Meantime, so far as your correspondent can learn, the successful production has not been solved locally, and the honor of so doing must rest with the Esteve Steel Company, as per your April 5 issue.

I heard some months ago that 1000 tons of iron sand were to be shipped to the mother country in the interests of English ironmasters for experimental purposes, but am not aware this has actually been done.

Railway Development.

The iron and steel trades of America will probably find that the most important developments directly concerning them, in connection with the affairs of this continent, will be the solving of the problems of the different States' railways when these are handed over to the Federal Government. Altogether apart from the financial aspect, or the question of the policy of the State as sole landlord, is the question of railway extension, uniformity of gauge, &c.

It will probably be news to you that, for some absurd want of foresight, each of the colonies of New South Wales and Victoria, at present the principal ones in point of population and wealth, possess railways of different gauge, the Victorian one being the wide gauge, 5 feet 3 inches, and the New South Wales the narrower one of 4 feet 8½ inches. Uniformity of gauge will be one of the first subjects to be settled. Next, the question of building railways for military and strategic purposes, national development, &c., will have to be taken in hand and energetically pushed forward. Railway engineers in your country will thus do well to watch carefully for these developments.

Already the internal commerce of Australia is rapidly increasing, and it is interesting to note at this juncture that New Zealand is just about to place contracts for some 2000 cars to cope with her own increasing trade. These, being wanted immediately, will have to be made beyond the colonies. Each individual State, as a State, is at present giving great attention and spending large sums of money to increase its own railway facilities, and this expenditure is rendered absolutely necessary by the demands of the hour, due chiefly to industrial activity. Leaving intricate questions of our railway policy alone, as being unfitted for the columns of *The Iron Age*, it is not necessary to say further than that railway material of every kind will be in demand heavily in Australia within the next few years.

New Caledonian Iron Ore.

Rumor has it that an English syndicate is but awaiting the completion of the Port Kembla harbor works, in the Illawarra district of New South Wales, and a little to the south of Sydney, for the establishment of works to supply the whole needs of Australasia in the pig iron market. The syndicate further expect to ship and sell even in the English market at a profit. This will be carrying coal to Newcastle with a vengeance.

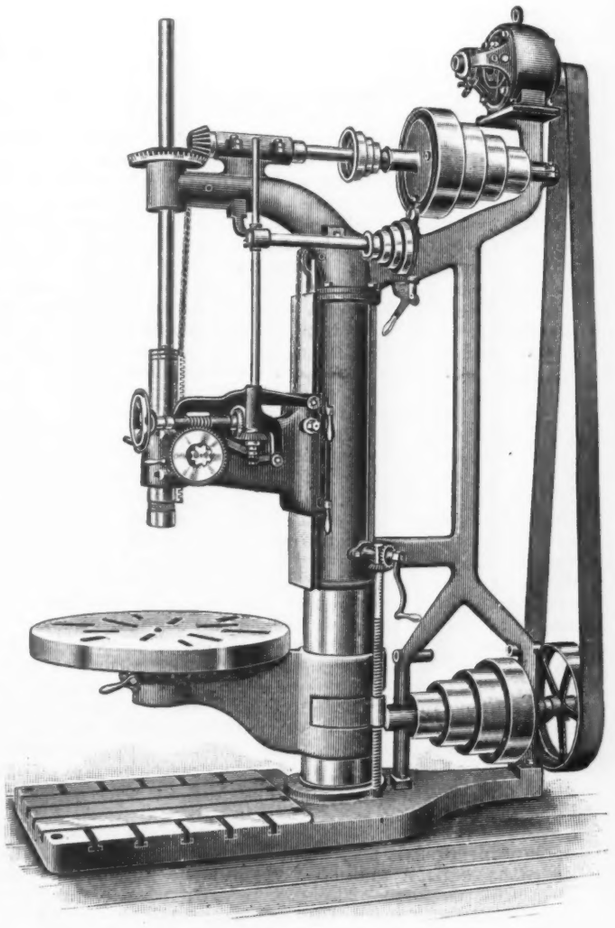
The scheme is based upon recently expressed expert opinion that in the island of New Caledonia, lying in latitude 20 degrees to 23 degrees south and 165 degrees east longitude, some 700 miles from the Australian coast, there is a mountain of the best iron ore in the world which could be shipped from the mine to the Illawarra (Port Kembla), where splendid coal for the works is being turned out. The project certainly seems most feasible. That New Caledonia possesses rich deposits of iron ore has long been known, but the difficulty has lain in the way of profitably working them in Australia. Labor is cheap in the island, whose population consists of about 10,000 free whites, mostly French, in addition to about 6000 convicts, and a large sprinkling of Japanese, Kanakas and Arabs.

Chrome ore is the chief mineral product, about 1000 tons a month being exported, the export of nickel ore having fallen off on account of overproduction in other parts of the world, cost of shipping, &c.

Noumea, the chief town, is a handsome, attractive place, and possesses two or three hardware establishments which compare most favorably with those of Melbourne and Sydney, having regard to the relative populations.

The Barnes Motor Driven Upright Drill.

The accompanying engraving shows clearly the method adopted by the W. F. & John Barnes Company of Rockford, Ill., for electrically driving their vertical drilling



THE BARNES MOTOR DRIVEN UPRIGHT DRILL.

machines. An upward extension of the top of the rear portion of the frame provides a platform for the support of the motor. From the motor the belt leads to a pulley on the end of the shaft carrying the lower step cone. This plan places the motor in an out of the way position, free from the dust and dirt of the floor.

The Motzinger Device Mfg. Company, Pendleton, Ind., manufacturers of the auto-sparker for gas and gasoline engines and other automatic devices, have just completed a new brick addition to their plant, 50 x 100 feet, to meet the growing demand for their product. They are operating their plant overtime.

A Modern English Blast Furnace.

The Millom & Askam Hematite Iron Company, Limited.

BY AXEL SAHLIN.

In 1899 the Millom & Askam Hematite Iron Company, Limited, Millom, Cumberland, England, decided that it would be prudent to employ a portion of their profits in gradually increasing their blast furnace capacity, and that the beginning should be made with a new blast furnace installation at Askam-in-Furness.

The present plant consists of ten furnaces of the standard English type. Six of these, located at Millom, are 70 feet high, and are at present lined to a bosh diameter of 19 feet 6 inches, with a 9-foot hearth. Each is blown by six 6-inch tuyeres. The remaining four furnaces are located at Askam. These when built were considered the largest furnaces in the world, being 75 feet high, with 32 feet diameter of shell. They are at present lined to a bosh diameter of 19 feet 6 inches, with 9-foot hearth. No. 1 furnace has just been demolished to make room for the new furnace. Two are blown by six 6-inch tuyeres, the other one by seven 6-inch tuyeres. The blast pressure at all the furnaces has recently been increased to 7 pounds.

Of the above furnaces, four at Millom and two at Askam are in blast, each producing on an average 130 tons per day of high silicon Bessemer metal of the highest grade. This output is fully up to the best practice of the district.

The reconstruction of No. 1 Askam furnace is now in progress, the new plant being as much as possible adapted for utilizing available portions of the existing plant. While this desire has had much weight in locating the various parts of the new plant, it has yet not been permitted to interfere with the essential efficiency of the new furnace.

The new furnace stack is 90 feet high, the steel shell being built of sufficient size to accommodate a 20-foot bosh. The present lining will be built to a bosh diameter of 18 feet. The hearth measures 11 feet in diameter at the tuyere line, and is fitted with 12 5-inch tuyeres placed 8 feet above the hearth level. Two slag notches are provided at opposite sides of the furnace. The tap hole is closed by a mechanical stopper worked by compressed air. The hearth is bound with cast iron coil plates 3½ inches thick and 8 feet high. The phosphor bronze tuyere coolers are supported by a belt of 12 cast steel collars strongly bolted together. The bosh is bound with five 9 x 1 inch steel hoops, and is cooled by 11 rows of cast copper cooling plates furnished by the Best Mfg. Company of Pittsburgh, Pa., under a guarantee as to composition of 99½ per cent. copper. The shell is supported by six columns 26 feet high, resting on a solid iron base 18 feet high, and leaving the bosh and lower part of the shaft accessible. The stock line at the top measures 14 feet in diameter, and is protected by iron plates built into the furnace wall. The ordinary Parry bell is 9 feet in diameter. Bell and hopper are both built with separate seal rings cast in segments. The charging is done by a single skip hoist with automatic rotating stock distributer furnished by the Brown Hoisting & Conveying Machine Company of Cleveland, Ohio. The skip has a capacity of 1 ton of coke, or 2 tons of ore. The hoist is guaranteed to handle 1300 tons of material per day. The top is also fitted with four self registering sounding rods operated from the hoist engine house, which is located in the stock house near the foot of the hoist incline. This arrangement will do away with all labor on the top of the furnace.

As the furnace is intended, if required, to work a large percentage of fine ore, eight 40-inch diameter explosion doors have been arranged around the shell under the steel top platform. The gas is drawn off by a 7-foot downcomer and enters tangentially near the bottom of the circular dust catcher, which measures 15 feet diameter by 50 feet in hight. From the top of this dust catcher, which is fitted with a large explosion door, a connecting pipe runs to the horizontal 7-foot 6-inch gas main which supplies stoves and boilers.

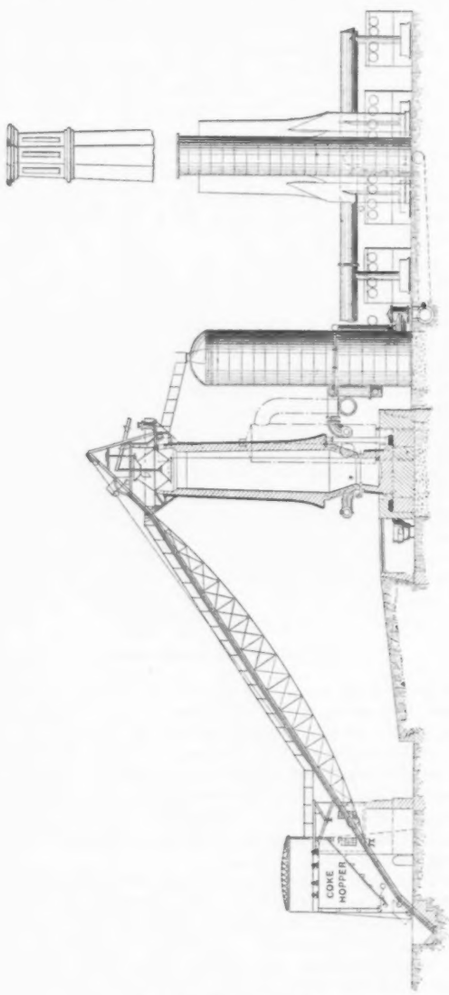
The furnace shell is unusually heavy and strongly braced. It has been built by Head, Wrightson & Co. of Thornaby-on-Tees.

The stove power has been increased by two Cowper stoves 21 feet in diameter, 90 feet high. The remainder of the stove equipment is made up of two existing 26 x 75 foot Ford & Moncur stoves. The furnace is thus equipped with four large stoves, which should provide very ample heat for any possible output. The stove casings and blast piping have been constructed by the Pearson & Knowles Coal & Iron Company, Limited, Warrington.

The boiler power for the new furnace consists of 2000 horse-power Babcock & Wilcox boilers, arranged in four batteries of two boilers each. These boilers are guaranteed for a pressure of 200 pounds per square inch, but are intended to work only at 150 pounds. They are connected with the engines by means of 16-inch steel steam pipe with welded steel flanges.

The draft is obtained from the present splendid smoke densing engine, high pressure cylinder 42 inches in diameter. Under normal conditions this stack gives a draft of 2¼-inch water column.

The present old type blowing engines are held as a reserve. In addition, one cross compound vertical condensing engine, pressure cylinder 42 inches in diameter, low pressure cylinder 80 inches in diameter, blowing cylinders 84 inches in diameter, stroke 60 inches, is being erected. The central fly wheel is 24 feet in diameter and weighs 45 tons. The hollow forged steel crank shaft is 21 inches in diameter in bearings, 23 inches diameter in center. The main bearings are water cooled



Cross Section of Plant.

A MODERN ENGLISH BLAST FURNACE.

and self adjusting. The length of each is 36 inches. The steam valves for the high pressure cylinder are of the Corliss type, admitting of a cut-off at any point between 0 and three-fourths of the stroke. For the low pressure cylinder double piston valves are provided. The governor, which will control at any speed, 20 and 55 revolutions, is adjusted when the engine is running, and acts directly on the trip gear of the high pressure cylinder. The steam receiver between the cylinders is superheated, and a special arrangement has been made for running high pressure steam into the low pressure cylinder if desired. The engine is equipped with barring engine. The blast valves are of the Southwark gridiron type. The inlet valves are positively driven from eccentrics. The outlet valves are automatic and controlled by the difference in pressure in the receiver and air cylinder. By this arrangement the clearance in the blowing cylinders is reduced to less than 1 per cent. The engines are guaranteed with steam at 125 pounds to run at a speed of 55 revolutions against a pressure of 20 pounds per square inch. At this speed the displacement capacity will be over 42,000 cubic feet per minute. The engines weigh about 350 tons, and are built by Galloways, Limited, of Manchester.

The engine house is built of steel with brick filling, and is amply lighted. It forms a continuation of the present engine house, and measures 43 x 34 feet by 52 feet high to the heel of the roof trusses. The roof is covered with slate. The engines are controlled by a 15-ton hand crane, which runs on tracks extending 15 feet outside the gable of the engine house and over a railway track, from which any parts of the engines can be readily lifted. A lean-to to the main building 24 feet wide, covered by a 5-ton hand crane, affords space for the auxiliary machinery.

The central injection condenser is fitted with three Edwards patent air pumps, 38 inches in diameter by 16-inch stroke. The steam engine for driving the same is compound condensing, having a high pressure cylinder 16 inches in diameter, low pressure cylinder 30 inches in diameter, stroke 18 inches. It is governed automatically by the variations of the vacuum. The condenser has a capacity of 80,000 pounds of steam per hour, giving a vacuum of 26 inches with feed water at 70 degrees F. It is being built by Andrew Barclay, Sons & Co., Limited, of Kilmarnock.

Surface water is collected from the adjacent hills and stored in reservoirs recently extended to the area of 10 acres. In addition, an artesian well is worked by compressed air. The service water is drawn from a steel standpipe 100 feet high by 15 feet in diameter, giving a pressure at the tuyeres of 35 pounds per square inch. The service pumps are built by Frank Pearn & Co. of Manchester, and have a capacity of 2,000,000 gallons per 24 hours. The boiler feed pumps, also constructed by Pearn & Co., serve the boilers with filtered water.

The electric light and power plant consists of two units, each 50 kw., 250 volts, direct coupled generators, of which only one is being installed at the present time.

The slag is removed in Weimer slag cars of 200 cubic feet capacity. The metal will at first be cast in sand, but provision is made for the eventual construction of casting machines or pig breakers, as circumstances may require.

The present stock house, 460 x 50 feet by 40 feet high to rail level, is being utilized. At each end of the building the railway cars are lifted by direct acting hoists worked by steam or compressed air. The bins for limestone and local ores, which arrive daily, are provided with hoppers and chutes from which the ore is drawn directly into the charging barrows, leaving only the stock ore to be shoveled from the ground. Provision has been made for installation in the future of a Brown bridge tramway with automatic shovel.

The coke is drawn directly from a storage bin into the skip of the hoist without shoveling.

Railway tracks around the furnace are all of standard gauge and horizontal, all grades being avoided.

The furnace is entirely separated from the remainder of the plant, and will be worked independently. It will be ready for blast during the coming winter.

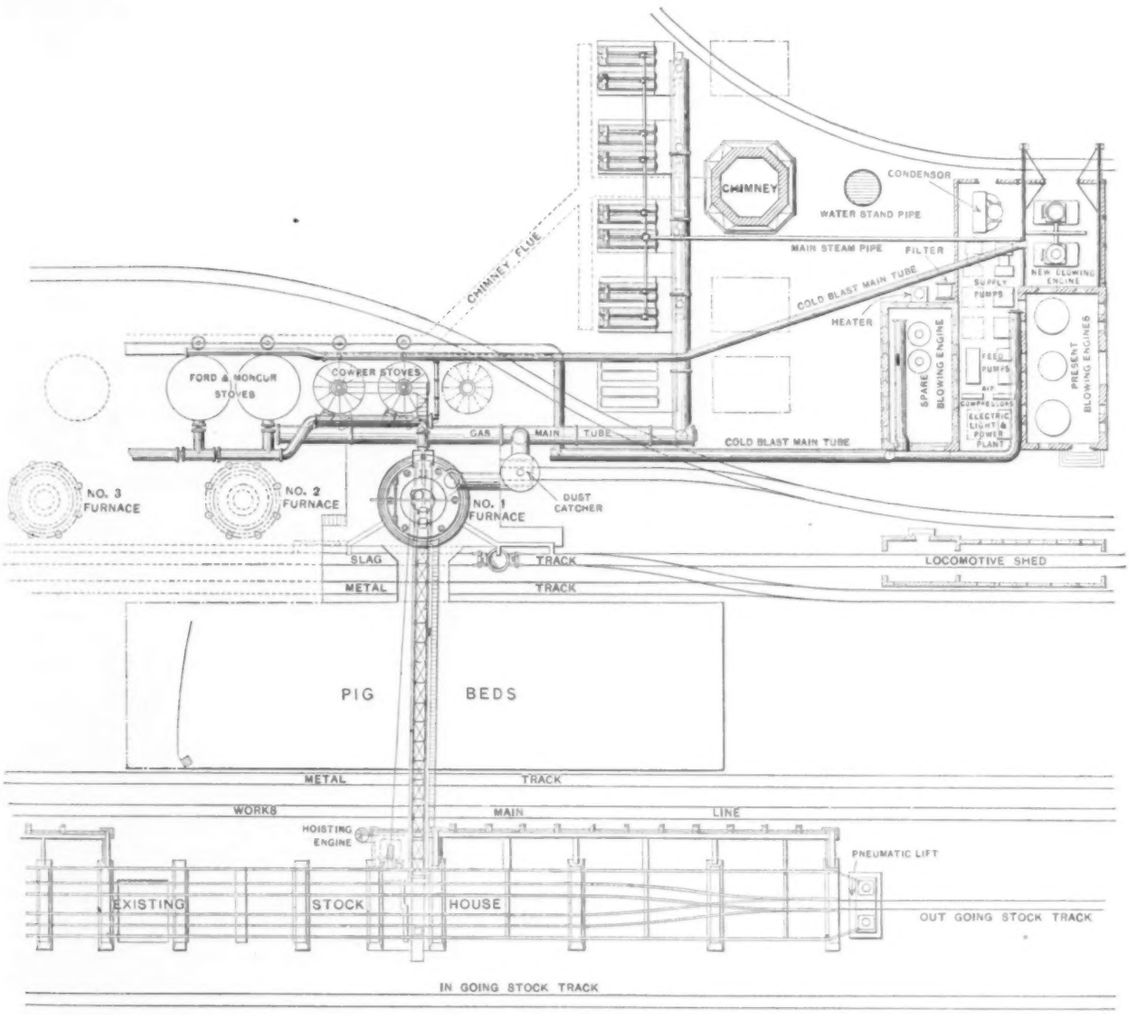


Fig. 2.—General Plan.

A MODERN ENGLISH BLAST FURNACE.

It is not desired to give any impression as to the probable output of the new furnace. As its products are to be sold in the open market, it is necessary to cater to the demand at present prevailing in England for a high silicon iron. Coke economy and large output, as measured by American standards, must, therefore, be sacrificed, and the hearth diameter correspondingly reduced. Part of the ores to be reduced are also of a lean character, the mixture averaging less than 50 per cent. Nevertheless it is confidently anticipated that the furnace in labor saving, fuel economy and output will well justify the heavy outlays for its equipment.

The Roane Iron Company, Rockwood, Tenn., are building a new blast furnace, 18 x 80 feet in size, to have four fire brick hot blast stoves. The furnace will also be equipped with Walter Kennedy's automatic filling arrangement, Mr. Kennedy being consulting engineer for the erection of the furnace. As soon as the new stack is completed and put in operation the present smaller stack of the Roane Iron Company will be rebuilt to conform to the new furnace.

Canadian News.

British Columbia Iron.

American enterprise, which has done so much to develop the gold, silver-lead and copper deposits of British Columbia, is now turning its attention to the iron resources of the province. It has long been known that there is an abundance of iron on Vancouver Island, and on some of the islands between that and the mainland, as well as in certain localities of the mainland itself, but, as is remarked in the last annual report of the British Columbia Minister of Mines, up to the end of 1899, the time had apparently not arrived for the development of these deposits. In that report mention is made of a little iron mining on Texada Island, the ore produced being used as flux in the copper smelters. Thus, for this purpose the Van Anda Copper Company used iron ore from the Security mine in its smelter, and the Puget Sound Iron Company shipped last year 2000 tons of iron ore, to be used as flux in the silver-lead, gold and copper smelters in Everett, Wash. According to news just received from Victoria, B. C., a Mr. Sweeney and other parties, said to be interested in McKeesport works, have concluded to test some iron lands on the western coast of Vancouver Island. The deposits are on Barclay Sound. Options, it is alleged, have been secured on three large groups of properties, the options to hold until the end of the year. Several hundred men, it is expected, will soon be at work opening up the ore beds. If development proves the properties to be what they promise, there will be a big shipping business, the ore to be taken to works projected at Port Angeles. An attempt had been made to secure a site and bonus for such works at Victoria, but without success. It is claimed that the ore will run 72 per cent. iron. As the iron deposits of the Province are of the most part magnetite, so far as they are known, it is probable that the Barclay Sound bed is also of that variety.

Cape Breton's Second Iron Project.

It is announced that the financial arrangements have been completed for the transfer of the General Mining Association's fine coal properties in Cape Breton to the Nova Scotia Iron & Steel Company. The latter concern, incorporated by an act of the Nova Scotia Legislature, with a capital of $20,000,000, contemplate the erection of great iron and steel works at North Sydney, which is near the mouth of the bay on which Sydney stands, where the works of the Dominion Iron & Steel Company are being built. It is expected that the new company will take over the assets of the Nova Scotia Steel Company, who have iron and steel works at New Glasgow and Ferrona, coal and iron lands in Picton, and a portion of the ore deposits on Bell Island, New Foundland. Joined with these properties are to be the coal mines belonging to the General Mining Association. These properties being once merged, the construction of a great system of iron and steel works at North Sydney is deemed a certainty. The necessary powers to sell out to the new and larger corporation have been conferred on the Nova Scotia Steel Company by an act passed in the present session of the Dominion Parliament. According to advices received in Montreal John F. Stairs of Halifax and Graham Fraser of New Glasgow, N. S., have succeeded in securing in England $1,000,000 of cash required for the purchase of the General Mining Association's property. These men are at present in London. William Mackenzie and Donald Mann, two Toronto men, engaged together in several great enterprises, and who have important railway interests in Nova Scotia, have frequently been mentioned in connection with the North Sydney iron project.

A Brockville Fire.

A fire, which at one time threatened Brockville with destruction, broke out in that town the other morning. It swept away the foundry of Cossitt Bros., one of the largest and oldest manufacturing establishments in the town. The total loss is estimated at $140,000, that of Cossitt Bros. being placed at $125,000. The firm's insurance amounts to $50,000. The company's storehouses were completely filled with self binders, reapers, mowers, harrows and other agricultural implements. All this was burned. The fire could not have visited the works at a worse season. Besides the big output of implements stored on the premises against the harvest demand, there was an accumulation of the finest machine patterns, gathered in the course of a business that had been growing for 28 years. A very large number were saved, so that the company will be able to start up business again. It is the intention to proceed at once to rebuild.

The Iron Sand Dispute.

It is stated by the North Sydney *Herald* that there is a brisk competition between the Dominion Iron & Steel Company and a New York syndicate to secure possession of a large and valuable deposit of iron sand, discovered on the Labrador Coast. According to the *Herald's* account this particular bed is much more desirable than any of the better-known deposits further down the shore of the Gulf of St. Lawrence. It is described as containing an immense store of iron. An analysis, it is said, shows 68 per cent. iron.

Jacques Cartier Power Company.

The works of the Jacques Cartier Power Company, which have for several months been in course of construction, are to be completed by February 1. They are about 5 miles from Quebec City, to which they will supply light and power. The Jacques Cartier Falls are by no means so great a hydraulic force as are the Montmorency, and will yield not more than 3000 horse-power. Nearly $400,000 has been expended on the works, including in this the cost of generating machinery, poles and wires, as well as that of building the dam and power house. The works are equipped with a Westinghouse outfit. The turbines were supplied by S. Morgan Smith of York, Pa. H. C. Abell of Illinois is the engineer under whom the works were constructed. The capital of the company is $500,000.

Minor Notes.

The E. B. Eddy Company, Hull, Quebec, whose works were destroyed by the fire which devastated that city and Ottawa, have started to rebuild their numerous factories. A new machine shop has already risen from the ashes. They have ordered one or two paper machines in the United States, with which to fit up the paper mills in course of reconstruction. These machines will cost between $150,000 and $200,000.

H. Douglas, the American representative of Herr Krupp, has been in Hamilton for some days. It is said that he is consulting with the Nickel-Steel Company with a view to making an arrangement to supply material.

C. A. C. J.

Industrial Notes From Chester, Pa.

CHESTER, July 2, 1900.—Samuel R. Parcells of Wilmington, Del., and formerly of this city, has invented a composition of belt grease which prevents belts from slipping and preserves the belting. He expects to locate a pant in this city. He now has on hand orders for considerable quantities of the composition, but will not go ahead until complete arrangements are made to his satisfaction.

Most of the pipe that has been stored in the old Chester Pipe & Tube Mill Yard has been shipped and the yard is being cleared of stock and materials of all kinds. It is said by men familiar with the works that the plant will be started up by the Messrs. Potts, the original owners, as an independent concern after July 30.

Robert Wetherill & Co. of this city have just completed for the Clark Thread Company of Newark, N. J., a large Corliss cross-compound condensing engine, to be used in running the machinery in that company's factory. This is one of the largest engines ever built in Chester. It is capable of generating from 1200 to 1400 horse-power. The high pressure cylinders are 34 inches in diameter and have a 60-inch stroke; the low pressure cylinders are 60 inches in diameter and have a 60-inch stroke. In doing the ordinary work of the thread mills the fly wheel will make 63 revolutions a minute. The power generated by the engine is transmitted to the shafting in the operating rooms by four large belts from the fly wheel. This wheel is 24-inch face. It is made with a double set of arms and weighs 135,000 pounds. The air pump used in connection with the engine is of the vertical type and is driven from the crank pin of the low pressure side. It is 40 inches in diameter, has a 14-inch stroke, and is arranged with a jet condenser. It has proved satisfactory to a representative of the Newark concern and has been accepted and is now being erected at the thread mills.

The Crown Smelting Company, whose plant is located at Concord avenue and Patterson street, this city, manufacture bronze, brass, composition metals, gray iron castings and locomotive and car journal bearings, making a specialty of heavy bronze and brass castings; they also produce in ingot form, from various formulæ, bronze, brass and composition metal, producing, in fact, anything required in their line of foundry work. They are the inventors and sole manufacturers of Crown bronze, which is an improved phosphorized metal, especially adapted for locomotive and car bearings, gibs, slide valves, piston rings, &c. They have made the greater part of the bronze work required on the gun carriages manufactured for the United States Government during the last two years. Their plant occupies two buildings, one of them 55 x 205 feet, the other 50 x 150 feet, with an office 20 x 40 feet, and two stories high. Their ground

overs 1½ acres. The equipment is of the most improved type, including all apliances for the rapid production and handling of their output. The business was started in 1886, since which time the trade has grown until it reaches all over the United States, with exports to Nova Scotia and Japan. The officers are as follows: R. T. Dickinson, president; H. T. Davis, vice-president; George E. Crumback, treasurer and secretary; Charles K. Davis, manager.

The Vulcan Works, of this city, are manufacturers of steam engines and boilers, ice machines, open hearth steel foundry equipment, water works, Jenkins' patent marine governor, rolling mill work, valves and cocks for heavy pressure, cranes and accumulators, steam water and ammonia fittings, iron and brass castings, making a specialty of open hearth steel plant supplies, mining and cement machinery and cotton press work. The outlook for the remainder of this year is exceedingly promising, the company having a number of large orders on hand. The business was started in 1864 by W. H. Green and enjoys the distinction of being the only concern in the city that has been running continually for 36 years, never losing a day in all that time. The present company were incorporated in 1892. The plant of the company occupies a ground space of 300 x 755 feet, on which are erected brick buildings, three and one story high, divided into foundry, machine and boiler shops, equipped with improved machinery. The officers of the company are: W. H. Green, Jr., president; E. T. Robb, secretary; M. G. Green, treasurer, and W. G. Howell, superintendent.

The Robinson Geared Power Brake.

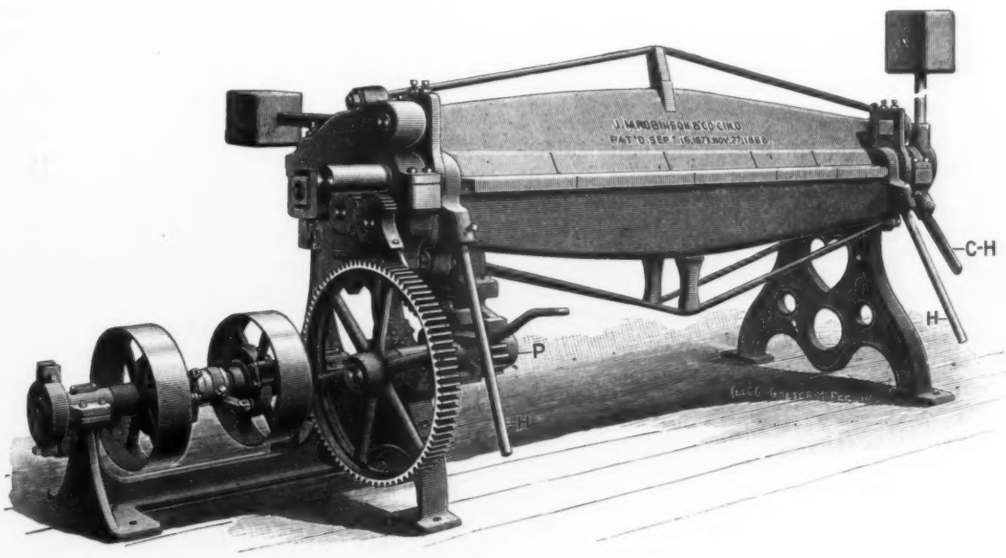
The brake herewith illustrated has been brought out by J. M. Robinson & Co., Cincinnati, Ohio, to meet the requirements of large consumers of heavy sheets, such as the navy yards, general shipbuilders, steel range manufacturers, &c.

To the bottom left hand end of the bending bar is secured a toothed segment, meshing with the pinion P, secured to the end of a shaft journaled to standard. To the opposite end of the same shaft is secured a large spur gear, driven by a pinion gear on the end of the shaft in the rear. This shaft receives its motion by means of two loose pulleys driven in opposite directions by cross and straight belts, with a sliding clutch operating on the shaft between the pulleys and connecting with either pulley, thus operating the bending bar up or down. A slight movement of the shifter handle connects the clutch to either pulley. There are two stops, one stationary and the other adjustable. The former will stop the bending bar at its lowest point. The latter can be arranged to stop the bending bar in its upward movement on the completion of the required bend, thus producing duplicate bends. The action of the friction clutch is very sensitive. It will stop the movement of the bending bar instantly, permitting no movement to carry it beyond the desired bend.

The handles H H are to be taken out when operating the brake with power. For light work the power is stopped, the handles H H are returned and the pinion P is moved out of gear, when the bending bar can be operated with hand power.

The clamping power is on a line with the bending point of the top clamp, and is operated with two steel eccentrics, one at each end, and is journaled into steel yokes, the top of which are journaled on a steel pin secured into the arms of the top clamp and are adjustable for clamping light or heavy material. The top clamp is adjustable to or from the bending point of the bending bar for sharp or round corners; also for heavy and light material.

The same brake when required for bending No. 10 gauge and lighter is double geared and operated with hand power. When bending No. 10 gauge, in order to obtain power, the motion is slow. For lighter gauges, or No. 14 and 16, and quick motion the gears are adjustable to single gear. For lighter material a further adjustment is made by moving pinion P out of gear and operating the bending bar direct with handles H H. Hence a brake is supplied for all gauges of material from No. 10 to 27 and lighter with the required working speed for each. This brake is built in 6 and 8 foot lengths.



THE ROBINSON GEARED POWER BRAKE.

Pawling & Harnischfeger, manufacturers of traveling cranes, Milwaukee, Wis., find no cause for complaint of the condition of business and are still operating their plant with a double crew. The outlook does not indicate that they shall reduce their working force or working hours in the near future. They have recently closed contracts as follows: United States Navy Yard, Mare Island, Cal., one 10-ton crane; Sullivan Machinery Company, Claremont, N. H., one 15-ton; C., B. & Q. Railroad Company, Hannibal, Mo., one 15-ton; United Traction Company, Albany, N. Y., eight 10-ton; Coe Brass Mfg. Company, Ansonia, Conn., one 8-ton; Edw. P. Allis Company, Milwaukee, one 3-ton; Lukens Iron & Steel Company, Coatesville, Pa., one 3-ton; Beaver Dam Malleable Iron Company, Beaver Dam, Wis., one 3-ton; Hackensack Water Company, Weehawken, N. J., one 6-ton. They have had the usual percentage of orders for electric hoists, trolleys, &c.

The Ohio Rolling Mill Company, Findlay, Ohio, have purchased the property, plant and appurtanences formerly operated under the name of the Findlay Rolling Mill Company and have thoroughly overhauled the works, rebuilding and replacing the old machinery with new. They have installed Hyde waste heat boilers and a heavy duty Corliss engine, drawing a 20-inch muck train and squeezer, and have erected new scrap and puddling furnaces with sufficient capacity to make a product of 100 tons per day, the greater portion of which will be worked into bar iron in a 10-inch mill, which has also been entirely rebuilt, and new rolls provided for all sizes suitable for this train. The mills are now ready for operating, a large amount of stock is in hand and work will be commenced as soon as the wage scale is settled.

The molders employed in the Cleveland, Ohio, district are still out on strike, their demand for a higher wage rate having been refused.

Lake Iron Ore Matters.

ISHPEMING, MICH., June 30, 1900.—Including all-rail shipments of the year to this date there have been sent down by mines to June 30 about 7,250,000 gross tons. There are 1,000,000 tons more in dock at the various upper lake ports, and en route from mines. There is little cessation in the movement of contract ore, and none at all by many of the largest shippers. In view of these facts it seems idle to argue the feeling now prevalent at Cleveland that the total season's shipments will not exceed 16,000,000 tons. Practically half that much is already out of the way and there remains five months. The old custom of shutting off shipments the middle of November is gone with the arrival of great steel ships, and considerable ore now goes down in December.

It now looks as though there was to be tonnage enough on the lakes to move 3,000,000 tons a month without recourse to the laid by Rockefeller ships. June's movement has been more than that, and these ships have been idle most of the month. The truth is there is no ore for them to carry, even with the present great volume of traffic, and therefore laying them up is only a reasonable, but costly, solution of a problem. Lumber traffic of the upper lakes is only about 60 per cent. of last year, and a veritable calamity has befallen the grain crop of the Northwest that usually finds its outlet via Duluth, so that but little tonnage will be demanded by it in the fall. That freights will be at a remarkably low point next year, if natural conditions govern, seems now practically certain. Ore men are already figuring that they can make concessions of 50 cents to $1 a ton and still have better balances than this year, figuring the probable changes in freights and labor. There is no question but labor will scarcely be able to secure so high wages as now.

On the Mesaba range a new village has been started about half way between Hibbing and Mountain Iron, to be called Sharon, after the Sharon Steel Company of Pennsylvania, whose mine adjoins the town. There are some eight or nine known ore bodies near the new village, and its future is looked on as promising. It is somewhat surprising to note the activity of these mining villages, in view of present conditions as a casual and surface view regards them. A few days ago 50 feet frontage in the village of Eveleth, not the best site in the town by any means, was sold for $4000, and there is reported to be quite a demand for property in the burned part of Virginia, for improvement or speculation. Another town will probably be started west of the new Sharon and still another between Sharon and Hibbing. Exploration in the latter section has shown plenty of mines to support a good village, and they are owned by companies of prominence and importance.

Some mines of the Mesaba are reducing outputs, for a while at least. Ohio is not shipping now, though a contract for removing 150,000 cubic yards of earth is going along rapidly. A large number of men and a steam shovel are employed. Oliver has but one shovel in ore, and one in stripping. Victoria has mined enough ore for the year and closed this week with a large stockpile on surface. Franklin and Bessemer, which with Victoria form the Republic Iron & Steel Company's properties on the Mesaba, are both nearly idle for a few days, but will probably be busy again as soon as some merely local conditions are overcome. Auburn has not sold its ore as well as was hoped, and has reduced its force. Sauntry will not ship over 200,000 tons at most and none now. Williams is closed indefinitely, but probably for all summer. It is a very small property, as Mesaba mines go.

The Republic Company are exploring some State leases east of and adjoining the Mountain Iron lands, and have just struck ore 550 feet east of the line; they think they have a 40-acre tract almost covered with ore of about Mountain Iron grades and character. They have several million tons in their deposit, probably. Adjoining them again on the south are four more State leases under exploration that have shown already some 6,000,000 tons of about the same quality of ore. These State lands return 25 cents to the school and public institution funds of Minnesota for every ton mined, and are taken under a contract to that effect. Fifteen to 20,000,000 tons of ore has been found on them this year already, and the possibilities are that much more may be found on leases that are shortly to be explored. The State school and university funds now amount to some $15,000,000, and the mineral additions will make them immense. Oliver and Minnewas mines are State lands, several Western Mesaba prospects, including Mesaba Chief, are the same, and some very good lands in 58-19 and 59-14 are under lease now.

I learn from headquarters that the reports from Ishpeming as to the serious condition of Negaunee mine, Negaunee, have been exaggerated. The mine is now hoisting 500 tons daily and will be making 1000 tons in two months. Its output this year will be over 200,000 tons. Manager Sellwood has gone down and around the trouble and is about ready to turn out a big product again. Negaunee is a big mine and will be a very large and economical producer another year. All Cleveland-Cliffs company mines combined will make an output this year of 1,250,000 tons. This is not only for its Ishpeming properties but at the half dozen others at Michigamme and elsewhere on the Marquette range. As the company own a half interest in the Lake Superior & Ishpeming road these increased shipments will swell its ore tonnage materially.

In spite of many pessimistic prophesies, the Marquette range should produce this year not less than it did in 1899, and it is hard to see how it can do very much less than 4,000,000 tons. The Oliver Iron Mining Company alone will ship 1,200,000 tons, Cleveland-Cliffs as much, Lake Angeline nearly 500,000, Cambria and Lillie 300,000, Negaunee 200,000, and Republic, Champion, Winthrop, Princeton, Jackson and other smaller ones ought to get down 500,000 more. There is a sharper demand for these old range ores than for some others, and if any marked falling off is made this year it will probably be from here in less proportion than some other range.

Norrie group and Aurora and Tilden mines, the splendid group belonging to the Oliver Company on the Gogebic range, are expected to mine this year 1,600,000 tons, and are shipping at that rate now. Ashland mine is steadily shipping to Chicago and has been since January 1. Its product for the year cannot well be less than 250,000 tons. In the Sunday Lake district there is a production that foretells 200,000 tons for the year, and the Corrigan mines, a little way west, will do almost as well. Palms is good for as much, Newport for the same, and the west end of the range, Montreal, Atlantic, Iron Belt and the Curry properties are good for at least 500,000 tons more.

Chapin mine of the National Steel Company, on the Menominee range, is shipping at the rate of 1,000,000 tons for the season, and Manager McNaughton says the product will be that much. This, with the Pewabic, Aragon, Iron River, Hemlock, Penn, Wisconsin and other groups, should easily make a total of 3,000,000 tons for the range. Cuff has not been abandoned by the American Mining Company, but its product will be 50,000 tons instead of 125,000, and all the ore to be shipped is mined. Aragon has received a duplicate pneumatic tramming plant to go into the new ninth level. The pneumatic tram locomotive on the eighth level has proved very satisfactory, and is now handling 1200 tons of ore daily, which is within 300 tons of the entire output of the mine. One locomotive, with 14 cars and handled by two men, is doing the work of six mules and 12 men. With the system operated at its fullest capacity the saving will be still more. The mine has just installed a 1000 horsepower Hoppe live steam feed water purifier that in the first 30 days of its operation gathered 1500 pounds of scale that would have otherwise gone into the boilers.

The traffic of the various mines of the Mesaba range is one of the plums that roads strive for earnestly. By an agreement just made all the ore to come from the new Spruce, the old Cloquet in the southwest part of 58-17, and the new Union and Kimberley lands in the northern part of the same township, is to be hauled to the lake over the Duluth, Missabe & Northern Road, and the consideration—as it appears—for this contract is the loan of $300,000 to the Union. The Spruce and Union alone contain some 12,000,000 tons of ore, and the Kimberley and Wyoming are probably of very good size. The rate is 80 cents a ton, or what lesser rate may become the public charge for hauling from the range to Duluth.

Assessments of $250,000 for Mohawk and $300,000 for Adventure copper mines have been called for the purpose of building stamp mills. D. E. W.

The June receipts of ore at Ashtabula Harbor, where the Pittsburgh & Lake Erie and Pennsylvania lines get the bulk of their business, broke all previous records for a single month. During the month 683,838 tons of ore were received, which was 156,526 tons greater than was ever before recorded in one month. The coal shipments received aggregated 231,000 tons, an increase of nearly 100,000 over June, 1899. The tonnage of coal and ore amounted to 914,996 tons, enough to load 32,864 cars of 40 tons each.

It is stated that the New York Air Brake Company have established business relations with the Russian Government, and are now making deliveries on a contract to equip the Imperial Railroad with air brakes, which will net the concern a very large profit. There has been intense rivalry between the Westinghouse Air Brake Company and the New York Air Brake Company to secure this business, but it is now claimed that the first named concern have taken the contract.

The International Congress at Paris.

EDITORIAL CORRESPONDENCE.

PARIS, June 23, 1900.—The Paris Exposition has been the occasion for the gathering of a series of international congresses of all kinds, and, among others, that of mining and metallurgy. Over a thousand delegates entered their names on the registers of the latter, the preponderance, of course, being with the French and the Belgians. The congress was divided into two sections, one for mining and the other for metallurgy, who held their proceedings in separate halls. They met only at the first general session and at the banquet which the French engineers tendered to their foreign friends on the 22d. Every morning the French metallurgists acted as guides in a series of visits to those parts of the exposition which might interest the visitors.

On Tuesday afternoon the chair of the metallurgical section was occupied by Sir Roberts Austen of the British Mint, there being in attendance as representatives of the United States James Douglas, president of the American Institute of Mining Engineers; Professor H. M. Howe of Columbia College; A. L. Colby, metallurgical engineer of the Bethlehem Steel Company; L. G. Laureau and Chas. Kirchhoff of New York.

The secretary and interpreter of the meeting was M. Auguste Dutreux of the Chatillon-Commentry Company, whom many Americans will remember as a visitor to the United States. Among the English metallurgists present were Bennett H. Brough, secretary of the Iron and Steel Institute; G. J. Snelus, identified with the early history of the basic process; J. S. Jeans, editor of the *Iron and Coal Trades Review*, and Professor Bauerman. Among the Continental metallurgists your correspondent observed E. Schneider of Creusot, Tschernoff of St. Petersburg, Margery of Roth Erde, Max Meyer of Differdange, Dowerg of Kneuttingen, Gillon of the Liége School of Mines, Brisson of the Ecole Centrale, Evrard, R. de Wendel, Tauzin of St. Etienne, Mayrisch of Dudelange, Greiner of Seraing, Dreux of Lonwy, Prof. Le Chatelier Dumas of Imphy, Dumenge, the author, and Brustlein of Holtzer & Co., the makers of special steels at Unieux, Loire.

The sessions generally were poorly attended, a fact which finds a ready explanation in the counter attractions of the Exposition. The first session was given entirely to a paper by Prof. H. Hubert of the Liége University on the "Direct Utilization of Blast Furnace Gas for Motive Power." Professor Hubert has carried through the testing of the Delamare-Debouteville gas engine at the Cockerill Works at Seraing, and while far more elaborate, the paper does not furnish any additional figures beyond those which Mr. Greiner placed before the Iron and Steel Institute quite recently. Professor Hubert reviews the history of this latest development in iron metallurgy. In the discussion M. Demenge referred to results obtained with the Oechselhaueser motor, while M. Dutreux called attention to the recent announcement, in *Stahl und Eisen*, of the latest type of furnace gas motor brought out by the Koerting firm.

At the session on Wednesday afternoon Tchernoff, the veteran Russian scientist, presided, graceful references to his work in connection with the physical structure of steel bringing out quite an ovation. In the absence through accident of M. G. Rocour of the Société des Forges et Aciéries du Nord et de l'Est, Professor Brisson read an abstract of the paper on the

"Actual State of the Manufacture of Thomas Steel and Its Effects on Puddling."

M. Rocour was the agent in France and in Belgium of the basic process, and has closely followed its rapid growth, the production having risen to 12,700,000 tons in 1899 out of a total product of 27,000,000 tons of steel ingots for the world's production. His review of the technical improvements, like the mixer, the Darby process for recarburizing, the betterments in basic linings, &c., which have aided the progress of the basic process, was clever. In France only twice as much steel as iron is made, while in Germany five times as much is produced. M. Rocour explains this by stating that in Germany during the last depression soft steel was sold at as low a price as was puddled iron. In France the limited number of steel works which sell billets has made it possible to maintain a difference between rolled steel and rolled iron which has enabled the iron mills to continue making at a profit. He believes, too, that the busheling of certain kinds of iron scrap is more advantageous than it is to melt them down in an open hearth furnace, and this will keep many small, scattered mills going at points where there is an abundant resident working force and local customers. While in general giving preference to basic steel, M. Rocour admits that there are uses for which iron is adequate. Steel has conquered the rail trade, has captured the wire trade, is prominent in plate manufacture and in beams and shapes, but iron still occupies a place in France through artificial market conditions, the exaggerated number of sections, &c.

A comparison of the underlying economic conditions shows that the higher price of basic pig, due to the necessity for adding maganiferous ores, to the heavier consumption of coke and to the lessened output of the furnaces, is nearly balanced in the case of mill iron by the greater waste in puddling and in reheating iron, when comparing it with the loss in blooming and in rolling heavy steel sections. When reheating the steel becomes necessary for rolling lighter sections the waste in this second reheating must be counted against steel. Similarly the basic steel process must be charged with the extra cost of ferro or spiegel, and with the cost of the lime additions. As for the fuel consumption, it is close to 1500 kg. per 2000 kg. of rolled iron, while the steel works rarely go below 400 kg. of coal for large sections, plus, in the case of plants which do not work direct, from 120 to 150 kg. of coke for melting the pig. So far as the by-products are concerned the value of the basic slag obtained in the Thomas steel process is very closely balanced by the selling value of the phosphoric puddle cinder, for which there is a good market. As for labor, there can be no doubt that the basic converter has a decided advantage over the puddling furnace.

M. Rocour summarizes the position as follows:

1. The manufacture of iron will continue, at a steadily reducing rate, for working up scrap into small sections and for special purposes, and this will continue so long as in the market scrap steel does not predominate and so long as the competition of the open hearth plants does not run up the price too much.

2. That puddling must be restricted and tend to disappear more and more rapidly as the price of coal keeps at a high level and the supply of skilled men declines. Still, so long as competition among the steel mills does not force them down to the prices which they are capable of reaching puddling must continue to exist.

3. If a crisis should develop—a crisis which must follow when the steel makers cease their understanding—then the different lines of rolled products will tend to concentrate in the hands of a few large basic Bessemer works located at the ore, or at the fuel.

4. The open hearth mill will retain the monopoly of special quality products, but cannot, in the matter of prices, compete for ordinary lines with basic Bessemer. It will, in those countries in which blast furnaces have sufficiently phosphoric ores, tend to concentrate in the large basic Bessemer plants, which possess in their scrap a cheap raw material and which, besides, have more powerful and more economic rolling mill equipment.

Some exception was taken to M. Rocour's statements of the relative status of the basic and the acid Bessemer process by a representative of a district which is chiefly dependent upon the latter, but the discussion, which might have developed some interesting data, was headed off by the plea that both have their sphere. As a matter of fact, it is difficult to escape the conviction that the French steel trade is bound at no distant date to face the issue of the competition between the cheap basic steel of the Eastern Minette district and the acid steel made in the older producing sections, in the center and in the north of France, from foreign ores.

Professor H. M. Howe of Columbia College presented a paper, in which he reported the progress in American Bessemer and open hearth practice, citing recent records. He reviewed the Bertrand-Thiel process, and described the Talbot continuous process.

A very elaborate paper was that of L. Babu, professor of metallurgy at the School of Mines of St. Etienne, on

"The Manufacture and Working of Special Steels,"

the introduction reviewing theoretical considerations, the critical points, &c. The second part deals with the methods of manufacture, M. Babu being located in a district which is being more and more crowded into this specialty. We gather the following data from this presentation:

Chrome Steel.—In the manufacture of chrome steel in the open hearth furnace the ease with which this element oxidizes at high temperatures is troublesome. The chrome burns on the surface, and this combustion at the same time tends to decarburize the steel and oxidize the iron. The chrome oxide, being infusible, does not yield a fusible silicate. A creamy skin forms on the surface, small particles of which sometimes remain entangled in the metal itself. The effort produced by the oxidation of the chrome is more pronounced with the increase in the percentage and the lowering of the carbon contents of the steel. For this reason, and because industrial requirements have not called for it, steel higher than 3 per cent. of chrome, and particularly chrome nickel steels for armor and projectiles, is not made in the open hearth furnace. Both acid and basic hearths have been tried. The observation has been made that on an acid hearth

the oxidation of the chrome takes place much more rapidly than on a basic lining, and that however quickly the operation be carried through, a large part of the chrome oxidizes and passes into the cinder. The product thus obtained has, therefore, an uncertain composition, since the percentage of chrome eliminated sometimes rises to 80 per cent. of the total charged into the bath. The oxidation is much less rapid, however, when the bath contains besides the chrome a notable quantity of nickel.

On a basic hearth, on the contrary, much more uniform results may be obtained. The loss may be easily reduced to less than 20 per cent., and it is this figure upon which certain works base their calculations on the addition of ferrochrome to the bath. In well conducted melts the loss of chrome should be low and be less than 5 per cent. The chrome addition is made as late as possible, but it is not effected in the ladle, because usually the addition is so large that there is danger of chilling the steel.

Usually the operation is carried along until the carbon contents have been reduced to the desired point, allowance being made for the introduction of carbon by the chrome alloy. The preheated ferrochrome is added and the metal is tapped as soon as the addition is melted. Sometimes neither ferromanganese nor ferrosilcon is charged, the presence of crome sufficing to refine the metal and prevent blowholes. Such a procedure is not without notable waste by oxidation, and it seems preferable for that reason to adopt the practice of some works who refine with ferromanganese before adding the chrome, in order to lessen the waste of the latter metal. Sounder ingots, too, are secured by adding a little aluminum or ferrosilicon in the ladle before casting.

Silicon Steel.—Steel carrying upward of 1 per cent. of silicon is used by a number of works for the manufacture of springs. They are readily produced in the crucible. Their remarkable properties, notably their ability to resist shock, naturally led steel makers to attempt the manufacture on a large scale for war purposes. Ten years since Creusot attempted to use open hearth silicon steel for the manufacture of gun shields and, somewhat later, in 1893, the Saint Etienne Steel Works also made in the open hearth furnace ingots for ship plates whose silicon contents rose to 0.40, with 0.68 per cent. carbon and 0.50 manganese. It was only in 1895 that the Imphy Works offered to the Puteaux shops silicon steel carrying over 1.50 per cent.

So far as the manufacture is concerned, it seems that there is no special difficulty in producing in an open hearth furnace steel carrying a specified percentage of silicon. But the results published thus far do not definitely establish the fact that it is possible to cast this steel into sound large ingots. Aside from this question of casting there is nothing to prevent the substitution of silicon steel for the soft steel employed in the manufacture of even heavy forgings.

Contrary to the practice with chrome steel, the melting of silicon steel is carried on on an acid hearth. Ferrosilicon is added as late as possible, when the heat is refined to the point of an extra soft steel. At this point sometimes the refining is stopped by throwing some coke dust on the bath and then, after preliminary heating up, the necessary ferrosilicon is added to get the contents specified. As soon as the metal is propely refined casting may be proceeded with without any other addition. Sometimes an addition of ferromanganese is made, as in the case of soft carbon steel, and then, apparently, the metal is sounder than without manganiferous additions.

Nickel Steel.—The production of nickel steel ingots is now a part of the current practice of all works making special steels. At first the nickel contents were limited to a few units, as Creusot did in 1888 for the armor of the "Dupuy de Lome" and the trial plates which gave such remarkable results at Annapolis. The special steels of Saint-Chamond, which date from 1892, those of Montlucon, of Creusot, of Saint Etienne, and of Unieux generally contain less than 3 per cent. of nickel with a certain proportion of chrome. Such is the case, for instance, with the armor plate steels, which usually contain 2.5 per cent. of nickel, with 0.8 per cent. of chrome and 0.4 of carbon. Sometimes for harder plates the chrome is carried up to 1.10 of chrome, with 2.15 of nickel. For several years extra soft steels were also manufactured with 1 per cent. of nickel.

The composition of gun steel does not differ much from that of armor steel. The Saint Jacques Works at Montlucon have made guns of steel carrying 2.5 per cent. of nickel and 0.5 per cent. of chrome, while the same steel adopted in 1894 by Imphy was free from chrome and contained 2 to 2.25 of nickel, 0.3 to 0.5 of carbon, 0.20 to 0.25 of silicon, and 0.38 to 0.42 of manganese.

The nickel contents adopted in America are usually much higher. By the side of mild steels with 2.5 of nickel hard steel is made which carries with 3.5 of nickel 0.90 of carbon.

Montatire appears to have been the first plant which, in 1885, took up high nickel steels for certain special manufactures. Imphy followed, but the product, too highly carburized, gave inconclusive results. James Riley first succeeded in 1888 in making fire box plates with nickel up to 25 per cent.

Since then the majority of the plants have studied high nickel alloys, and it was shown that steel with all ranges of nickel contents may be produced which are suitable for many purposes. Thus Imphy proposed steel containing 12.5 per cent. of nickel and 1 per cent. of chrome for certain thin armor plates, and at the same time furnished the army with 20 per cent. nickel ingots for tests for gun tubes. In this case the steel was quite complex, carrying more than 3 per cent. of chrome, nearly 1 per cent. of manganese, 0.587 of carbon, and 0.49 of silicon.

When it is a question of producing steel with less than 5 per cent. of nickel, the charge may be calculated by allowing a waste of 5 to 8 per cent. With the higher percentages the uncertainty increases. Nickel, which oxidizes less readily than iron at the ordinary heats, appears to become more subject to oxidation at higher temperatures. At the temperature of the open hearth furnace it oxidizes as readily as iron. The waste by oxidation is notable with high nickel steel. It reaches and passes 15 per cent. and goes as high as 20 per cent. when making 20 per cent. nickel steel.

The nickel is added either as pure metal or in the shape of nickel steel scrap. In the latter case it is introduced with the first charge, while the metal is preferably added hot after the first charge has been melted. Care must be taken about pushing the process by ore additions. At the high heat in the furnace nickel oxidizes by reducing the oxide of iron, and may pass completely into the cinder. Some works add the pure metal only a few moments before casting.

Usually the process is carried forward to the complete decarburization. Then the chrome may be added as 50 per cent. ferrochrome. The decarburization then stops, being prevented by the chrome, and in order to avoid the oxidation of the latter metal, the recarburizer, be it ferromanganese or ferrosilicon, must be quickly added. The addition of ferrochrome to the decarburized bath has the disadvantage of causing the deoxidation to be effected by the chrome itself, which may lead to a serious loss. It would appear more rational to add ferromanganese before charging the ferrochrome. It has been ascertained, however, that in certain cases, even when operating in the manner first described, nearly all the chrome is in the steel, which tends to show that the presence of nickel has the effect to lessen or even prevent the oxidation of the chrome.

Sound ingots are obtained in casting. The metal is very fluid and seems homogeneous. However, with steels carrying no chrome and having above 2.5 per cent. of nickel the ingot tends to crystallize when cooling slowly. These crystals do not disappear by forging, annealing or hardening.

Any irregular cooling of the ingots during solidification may create strains in the metal which may lead to surface cracks. An excellent precaution followed in certain works in order to render the cooling more uniform is to move the ladle while the mold is being filled so that the jet of metal strikes all the parts of the walls.

Professor Babu then goes into an elaborate description of the methods of working special steels, in which we cannot follow him in detail.

The discussion drifted off into a talk on theoretical points by Tchernoff and Le Chatelier, the practical features being only briefly touched upon by M. Dumas of the Imphy works.

At the Thursday afternoon session Prof. H. M. Howe of Columbia College occupied the chair as honorary presiding officer. A large part of the session was occupied by a further talk on the microscopic structure of steel by Tchernoff and Le Chatelier. P. Huth of Essen a. d. Ruhr, Germany, briefly described the principles underlying his method of centrifugal casting.

One of the interesting papers submitted was that of M. A. Tissot on the "Present Status of the Manufacture of Steel Castings," M. Tissot being connected with the Robert process. A paper approaching the dimensions of a treatise was that of a French artillery officer, Hartmann, on the "Phenomena which Accompany the Deformation of the Metals." A paper which contained a somewhat wicked attack on the American Patent Office practice was that of M. Heroult of the Froges Company on "Cheap Aluminum." Professor Wedding submitted a very elaborate paper on "Magnetic Separation of Ores." C. K.

The Simpson Iron Company, at Columbus, Ohio, have commenced work on their new buildings, which include a foundry. The plant is expected to be in operation in August.

The Iron Age

New York, Thursday, July 12, 1900.

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Agreements on Prices.

The attention of the public has recently been drawn to the reported meetings of leading iron and steel manufacturers in New York City. Various statements have been issued purporting to come from manufacturers who have attended these meetings. Some of these statements are of a very hopeful and definite character, going so far as to indicate that an agreement has been or shortly will be reached, covering the prices of pig iron and steel, that will assure stability to the market. Others represent no agreement having been concluded, but that a better understanding has been secured among the leading iron and steel interests, which will bring about and maintain amicable relations among them, and is likely to remove any friction which may have developed and thus avoid the destructive competition manifested in our past experience.

The most reasonable deduction to be made from the statements that have been issued is that no actual agreement on prices has been made, and that none will really be attempted. The market will, therefore, remain an open one instead of being even nominally controlled by fixed prices. Efforts have been made in the past to name prices in the expectation that the great producing interests would be able to so control the markets as to secure business at those prices; and it is true that we have seen times when efforts of this kind have been fairly successful. Those times, however, have been when prices were advancing, or when conditions were such that buyers were not seriously apprehensive of lower values. Even then such prices have only been temporarily maintained. Under existing conditions there appears to be no doubt of the effect of naming agreed prices to rule on certain products. It is only necessary to point to a few instances of this kind during the recent past which have proved to be totally unavailing against the influences of the market when tending steadily toward lower prices. The large manufacturers could probably easily agree on satisfactory prices if they covered the entire production, but this is not the case. The smaller manufacturers are desirous of securing business, and possibly in some instances are decidedly anxious to take orders. While they may not represent more than a small fraction of the output, they, at such a time as this, exert a potential influence in shaping the market. If their prices are only 50 cents to $1 per ton under those which might be named in an agreement by the large manufacturers, such concessions at once establish a lower market in the eyes of the buyers and they will not place orders at the higher figures.

The disposition among manufacturers to confer frequently with one another, and to avoid antagonism as much as possible, is to be commended rather than criticised. We have seen how disregard for other interests has resulted in disastrous consequences in the past, and it is well for all concerned to cultivate more amicable relations with one another. It would be unfortunate indeed to have another period of destructive competition inaugurated. The market should certainly find a substantial basis on which a good business can be secured without falling to the very low level of two years since. This result can probably be greatly assisted by the better understanding among manufacturers which is now being cultivated.

Monetary Principles.

It seems to be necessary to continue the discussion of the elements of a sound financial system, partly because the law of last March was not a final measure, but merely a long step in the right direction, and partly because the country is not entirely secure from the danger of its repeal, and even while standing on the statute book its purposes might be defeated and its spirit evaded by a Secretary of the Treasury who was not in sympathy with it, or who ignored fundamental financial principles. The law of last March does assert the single gold standard, but it was remarked upon at the time that it left the silver dollars in an anomalous position; it specifically continued their legal tender character and it did not contain the provision, which the House bill did, authorizing their redemption in gold if it were found necessary to do so to maintain the purpose of the bill. The law checks but it does not entirely prevent the operation of the "endless chain" of which we heard a good deal a few years ago—that is, the redemption of the legal tender notes in gold and their reissue, to be presented again for redemption in gold. While this is not probable it is possible, and the prospect of silver payments would be very likely to put the process into operation.

The law was deficient because it did not provide for an elastic bank currency, one that would increase in the fall and decrease in the winter and spring, when the demand for currency is much less. Such a currency actually exists in Canada, and year after year it increases materially in the crop moving season and decreases in the winter. It is doubtful if a bank currency secured by a deposit of bonds can be made elastic.

Unfortunately there are other things to do besides extending and perfecting the law of last March. No small part of the people believe that a bank currency not secured by bonds would be unsafe, and a large part of the population regard all bank notes with hostility. There are plenty of men who would, if they had the chance, replace the bank currency with irredeemable paper money, in spite of the disastrous experience of this country with a currency which was only temporarily and not avowedly irredeemable, and the collapse of the experiment of "fiat" money wherever it has been tried. The friends of a sound currency, the men whose opinions are based upon reason and experience, have got to fight for what bank currency there is and against the colossal blunder and fraud of irredeemable paper money.

And in spite of the fact that a gold standard law is on the statute book a great many people still believe in the practicability of free silver coinage at the ratio of 16 to 1 when the market rate is 33 to 1, or even more. The reasoning applied to all other things of value may safely be applied to money, but there is a surprising number of persons who will not do it. The Government can make wheat worth a dollar by paying a dollar for every bushel of wheat offered. It might in the same way make 1 ounce of gold worth 16 ounces of silver; so long as it bought the silver at that price the price would be maintained. But when its supply of gold gave out the price would have to fall, and no advocate of free silver ever expected the Government to buy silver with gold in order to sustain its price. He purports to believe that the Government could maintain the price of silver

by a decree, by a law; he might as well expect it to maintain the price of corn by a law. Free silverism assumes that the Government can fix the price of money. But to fix the price of money is to fix the price of all commodities, for all prices are the ratios between money and commodities. If a dollar be the price of a bushel of wheat, a bushel of wheat is the price of a dollar. There are very few persons who suppose that law can fix the price of wheat, but there are many who suppose it can fix the price of a dollar. Yet to do one is practically to do the other.

OBITUARY.

JAMES D. GILL.

James D. Gill, for many years in the hardware business at Meadville, Pa., died at his home in that city on the 1st inst. Mr. Gill was born in Hayfield township on September 17, 1822, and began his business career as clerk in the hardware store of Gill & Derickson. In 1844 he formed a partnership with James J. Shryock, the firm conducting a general store until 1857, when they embarked in the hardware business, in which they continued until 1873, when Mr. Gill retired to accept the presidency of the Crawford Mutual Insurance Company, which position he held until 1899. D. Arthur Gill is now the proprietor of what was formerly his father's store.

JULIUS F. PRATT.

Julius F. Pratt, vice-president and treasurer of the Atlas Engine Works of Indianapolis, Ind., died July 6, at Glengariff, Ireland, where he had arrived recently on a health and pleasure trip. Mr. Pratt was born in Worcester, Mass. He went West as a young man and settled in Indianapolis, entering the employ of the Woodburn-Sarvem Wheel Company, and later became one of the proprietors of the company. When this concern were absorbed by the American Wheel Company Mr. Pratt was elected president, serving in this capacity until the company dissolved. Afterward he became interested in the concern, of which he was an officer at the time of his death. He was a director of a number of banks and other corporations.

HAMILTON SMITH.

Hamilton Smith, a well-known mining engineer and a member of the firm of Smith & Perkins of New York, died suddenly of heart disease on July 4 while boating at Durham, N. H. Mr. Smith, who was a native of Louisville, Ky., was 60 years of age. As a mine operator he was identified with some of the largest deals in mining properties in the United States, particularly in copper; and he was the author of a text book on mining engineering that is recognized as a standard authority on the subject.

AMBROSE BEARD.

The death is announced as having taken place on June 19, at Weston-Super-Mare, England, of Ambrose Beard, a well-known member of the English iron trade, who for some years was a resident of the United States. He was 57 years of age, and was the second son of Ambrose Beard, who many years ago was one of the best known members of the South Staffordshire iron trade. The deceased was the only brother of George Beard, president of the Scotch Iron and Steel Institute. Thirty years ago Mr. Beard was selected by the late Sir William Siemens to undertake the practical management of experiments at a works in North Wales, and the result of this was the establishment of the Landore-Siemens Steel Works, at Swansea, of which Mr. Beard was manager until 1880. Subsequently for some years he was interested in the South Wales iron, steel and coal trades, but in 1894 he came to the United States as manager of a steel and tin plate company. Owing to bad health Mr. Beard returned to England last year. Another Ambrose Beard, a nephew of the deceased, is still resident in this country, and is well known in the sheet and tin plate trades.

HENRY B. SMITH.

Henry B. Smith, former head of the H. B. Smith Company, Westfield, Mass., died on July 1 at his home in that city, aged 83 years. He was born in Lyme, Conn., and in early life learned and followed the printer's trade. In the year 1840 Mr. Smith entered the mercantile business, and in 1853 with his brother Edwin he started the foundry business which bears his name. The firm of H. B. Smith Company are among the best known manufacturers of steam heating apparatus. For some years past Mr. Smith had not taken an active part in the business.

DAVID HALSTEAD.

David Halstead, senior member of the firm of Halstead & Co., brass founders and finishers of Philadelphia, died July 9 at his home in that city, aged 65 years.

The Sheet Mill Scale Settled.

At a conference of committees representing the Amalgamated Association and the American Sheet Steel Company, held in Pittsburgh on Saturday, July 7, the wage scale for the sheet mills for the year commencing July 1 was adopted. The scale is practically the old scale which expired on June 30, the few changes being unimportant. In the memorandum of agreement the words "Association of" have been stricken out. The base of the scale is 3 cents per pound for Nos. 26, 27 and 28 gauge black sheets, and this base is minimum. Should these gauges of sheets go to 2 cents, or even lower, the base rates would not be changed. The sheet mill scale as adopted is the same as the old scale and the footnotes are also the same, with the single exception that footnote No. 10, which formerly read "That the rollers on sheet and jobbing mills shall not be permitted to hold more than two turns," has been changed to read "That the rollers on sheet and jobbing mills shall not be permitted to hold more than one turn." In footnote 22 the words "That on and after July 1, 1896," have been stricken out. These are the only changes made in the sheet mill scale proper.

In the sheet mill hand scale no changes have been made in the wage rates, and the footnotes are the same until No. 7 is reached. In the old scale this read as follows: "On all sheets 36 inches wide and over the company shall furnish extra help necessary, not to exceed two men." This has been changed to read as follows: "The company shall furnish extra help necessary, not to exceed two men, on all sheets 36 inches wide and over, and on all bars of any width weighing 55 pounds or over." Footnote No. 11 has been slightly changed and in the old scale read as follows:

11. That any mill making sheets over twenty-eight (28) inches wide shall not be classed as averaging mills. Mills working narrow widths and short lengths to make the equivalent to fifteen (15) pairs of sheets per heat, containing fifteen and one-half (15½) superficial square feet each sheet. This to be governed by clause 9 of Sheet Mill Hands' Scale.

This has been changed to read as follows:

11. That any mill making sheets over twenty-eight (28) inches wide shall not be classed as averaging mills. Mills working narrow widths and short lengths to make the equivalent to fifteen (15) pairs of sheets per heat, containing fifteen and one-half (15½) superficial square feet each sheet, and where a mixed ton is worked to average up and down. This to be governed by clause 9 of Sheet Mill Hands' Scale.

A new footnote, No. 17, has been added and reads as follows: "No. 17. Twenty-five gauge and lighter, double double 84 pairs, shall equal 105 pairs of double iron and not to be averaged."

The principal contention over the sheet mill scale has been the refusal of the American Sheet Steel Company to sign the scale for mills which were operated non-union before being taken over by that concern. This contention was won by the American Sheet Steel Company, and they will only sign the scale for the mills which heretofore have been running as union mills. Two of the largest plants, these being the Apollo Iron & Steel Company and the W. Dewees Wood Company plants, will be operated non-union as heretofore. The Wellsville Plate & Sheet Iron Company, Wellsville, and also the Scottdale Iron & Steel Company, Limited, Scottdale, Pa., will also be operated non-union. Terms with employees of these plants will be arranged as in the past and the men will be dealt with directly. Most of the sheet mills operated by the American Sheet Steel Company where the scale has been signed have been put in operation. The balance will probably be started as soon as inventory and repairs have been completed.

An important event in the English iron trade is the purchase of the great Dowlais Works, the most extensive iron and steel plants in the South Wales district, by Arthur Keen, a prominent English iron master and president of the Patent Nut & Bolt Company of Birmingham, whose visits to the United States have made him well known in American iron and steel circles. The Dowlais interests include blast furnaces, steel works and forges, coal mines, Spanish iron mines, &c. The new company will be known as Guest, Keen & Co., Limited.

The Pittsburgh Electrical Machine Works of Pittsburgh have applied for a charter. They will build electrical machinery.

Pig Iron Production Sharply Declining.

Stocks Still Increasing.

Reports from furnace companies show that on July 1 quite a shrinkage had developed in the rate of production of pig iron as compared with June 1. The weekly capacity of the active furnaces was 12,963 tons less than a month previous. The shrinkage was entirely in coke and anthracite, as the charcoal furnaces have slightly increased their output. The number of furnaces in operation is larger than had been expected, but the curtailment of production is still proceeding and August 1 will show more out.

The weekly capacity of the furnaces in blast on July 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
July 1, 1900	284	288,413
June 1	293	296,376
May 1	292	293,850
April 1	291	290,482
March 1	293	292,643
February 1	296	298,014
January 1	280	294,186
December 1, 1899	283	296,959
November 1	277	288,522
October 1	265	278,650
September 1	257	267,335
August 1	244	267,672
July 1	237	263,363
June 1	230	251,062
May 1	217	250,095
April 1	205	245,746
March 1	192	228,195
February 1	195	237,639
January 1	200	249,516
December 1, 1899	195	235,528
November 1	196	228,935
October 1	192	215,635
September 1	186	213,043
August 1	187	206,777
July 1	185	216,311
June 1	190	225,398
May 1	194	234,163
April 1	194	233,339
March 1	193	234,430
February 1	184	228,338
January 1	188	226,608

The condition of the charcoal furnaces at the beginning of the month was as follows:

Charcoal Furnaces in Blast July 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England	7	3	350	4	360
New York	2	1	105	1	109
Pennsylvania	13	1	70	12	600
Maryland	4	1	86	3	440
Virginia	4	0	0	4	338
Ohio	7	4	306	3	210
Kentucky	3	0	0	3	300
Tennessee	7	5	1,061	2	320
Georgia	3	1	350	2	400
Alabama	5	4	1,239	1	100
Michigan, Missouri and Wisconsin	15	11	4,765	4	1,450
Texas	4	1	160	3	775
Totals	74	32	8,492	42	5,294

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
July 1, 1900	32	8,492
June 1	27	7,605
May 1	25	6,894
April 1	29	7,838
March 1	29	7,047
February 1	32	8,004
January 1	30	7,457
December 1, 1899	30	7,511
November 1	29	7,113
October 1	25	6,222
September 1	24	5,665
August 1	22	6,189
July 1	20	6,018
June 1	16	4,943
May 1	20	4,846
April 1	17	4,777
March 1	16	4,330
February 1	17	4,967
January 1	20	6,026
December 1, 1898	18	6,018
November 1	20	5,947
October 1	20	5,732
September 1	21	6,293
August 1	22	6,459
July 1	19	5,647
June 1	20	6,762
May 1	18	6,571
April 1	16	5,716
March 1	16	5,470
February 1	14	4,734
January 1	16	5,442

The condition of the coke and anthracite furnaces at the beginning of the month was as follows:

Coke and Anthracite Furnaces in Blast July 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York	13	5	5,753	8	6,815
New Jersey	7	4	2,367	3	1,623
Spiegel	3	2	334	1	166
Pennsylvania:					
Lehigh Valley	29	21	11,318	8	3,750
Spiegel	1	1	91	0	0
Schuylkill Valley	15	10	7,344	5	2,890
Upper Susquehanna	5	4	3,822	1	450
Lower Susquehanna	9	8	6,125	1	700
Spiegel	1	1	308	0	0
Lebanon Valley	13	9	7,967	4	4,000
Pittsburgh District	30	28	56,968	2	4,300
Spiegel	1	1	1,001	0	0
Shenango Valley	15	14	19,369	1	1,000
Western Pennsylvania	19	11	14,487	8	4,656
Spiegel	1	1	883	0	0
Maryland	4	3	4,333	1	175
Spiegel	1	1	707	0	0
Wheeling District	10	8	10,610	2	2,350
Ohio:					
Mahoning Valley	14	10	18,941	4	5,922
Central and Northern	11	10	18,529	1	1,960
Hocking Valley	2	2	1,100	0	0
Hanging Rock	13	10	5,400	3	1,680
Illinois	14	14	24,989	0	0
Spiegel	2	2	1,770	0	0
Wisconsin and Minnesota	6	5	4,322	1	763
Missouri	2	1	900	1	850
Colorado	2	2	2,674	0	0
The South:					
Virginia	21	17	10,200	4	2,900
Kentucky	6	4	1,600	2	1,200
Alabama	37	30	23,133	7	4,300
Spiegel	1	1	350	0	0
Tennessee	13	11	7,191	2	1,235
Georgia	1	0	0	1	450
North Carolina	2	1	85	1	352
Totals	324	252	274,921	72	54,387

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
July 1, 1900	252	274,921
June 1	266	288,771
May 1	267	286,956
April 1	262	281,644
March 1	264	285,596
February 1	264	290,010
January 1	250	286,720
December 1, 1899	253	289,448
November 1	248	281,409
October 1	241	272,428
September 1	233	261,670
August 1	222	261,483
July 1	217	257,345
June 1	204	249,119
May 1	197	245,249
April 1	188	240,909
March 1	175	223,865
February 1	178	232,672
January 1, 1899	180	237,490
December 1, 1898	177	229,510
November 1	176	222,988
October 1	172	209,903
September 1	165	206,750
August 1	165	200,318
July 1	166	210,664
June 1	170	218,636
May 1	176	227,502
April 1	178	227,628
March 1	177	228,960
February 1	170	223,604
January 1, 1898	172	221,166

Furnace Stocks.

Stocks of pig iron have shown further increase during the month, the gain in all kinds of iron having been 86,358 tons, as compared with stocks at furnaces on June 1.

The position of furnace stocks, sold and unsold, as reported to us, was as below on July 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron.

Stocks.	Jan. 1.	Feb. 1.	Apl. 1.	May 1.	June 1.	July 1.
Anthracite and Coke	107,231	126,418	177,650	216,182	305,952	387,482
Charcoal	20,115	21,918	19,882	24,895	28,728	33,556
Totals	127,346	148,336	197,532	241,077	334,680	421,038

Warrant Stocks.

The American Pig Iron Storage Warrant Company report receipts into the warrant yards during June of 1200 tons and deliveries of 200 tons, showing a gain in stocks of 1000 tons during the month, making the following showing as compared with previous months:

Stocks.	Jan. 1.	Feb. 1.	Apl. 1.	May 1.	June 1.	July 1.
Coke and Anthracite	3,200	2,800	1,500	2,600	3,400	4,400
Charcoal	1,700	1,500	1,400	1,400	1,400	1,400
Totals	4,900	4,300	2,900	4,000	4,800	5,800

German Importation of Duty Free Shipbuilding Material.

While in former years the official German statistics did not contain separate figures relating to the importation of shipbuilding material, which is admitted duty free into Germany, the official returns for 1898 and 1899 show special items, according to which the duty free imports of such material into the German empire were, during these two years, as follows:

Commodities.	1898. Tons.	1899. Tons.
Scrap and Iron clippings	64	112
Pig iron	4,498	3,803
Corner and angle iron	8,969	7,939
Fish plates and sleepers	.	32
Malleable iron in bars, also tinned	5,049	1,810
Plates and sheets of wrought iron	28,247	30,958
Rough castings	253	207
Anvils, crowbars	4	5
Anchors and chains	1,280	1,377
Wire rope	170	7
Rough parts of machinery	448	459
Gun barrels	6	7
Pipes rolled and drawn of wrought iron	30	40
Rough iron goods not polished, varnished and tinned	1,252	889
Rough iron goods, polished, varnished and tinned	80	219
Screws and bolts	7	7
Fine iron goods	13	18
Small castings	30	11
Boilers	169	158
Machinery, chiefly of cast iron	891	869
Machinery, chiefly of wrought iron	403	104
Machinery, chiefly of other materials	51	86

In these figures, however, are not included the imports for the yards situated in the free port pistrict of Hamburg.

From the statistical returns just published by the Verein Deutscher Schiffswerften, it appears that 22 German shipbuilding yards, including the largest private shipbuilding establishments, but not the imperial wharves, used in 1899 the following material: 95,945 tons of plates, of which 70,271 tons, or 73.2 per cent., were of German origin; 46,288 tons of bar iron and steel, of which 35,042 tons, or 75.7 per cent., were made in Germany. The German admiralty is now seeking information as to how far German mills can supply the needs of the proposed increase in the navy. According to the report of the Reichstag Committee on Naval Affairs just published, the expenditure during the next 17 years will consist of the following items: For new ships and their outfit, 1,790,000,000 marks, or about $425,000,000; permanent expenses, 2,070,870,000 marks, or about $517,717,000.

The total expenditure of the marine budget, from 1901 to 1917, will amount to 3,830,070,000 marks, or about $957,500,000, spread over these 17 years as follows:

Years.	Marks.	Years.	Marks.
1901	200,700,000	1910	231,810,000
1902	212,410,000	1911	229,210,000
1903	217,710,000	1912	230,700,000
1904	217,010,000	1913	232,900,000
1905	222,810,000	1914	235,710,000
1906	225,010,000	1915	237,010,000
1907	223,610,000	1916	236,910,000
1908	229,310,000	1917	229,210,000
1909	225,310,000		

It is a very great question as to whether the German iron works will be able to meet the requirements of the German yards during the coming years. All works are crowded with home and foreign orders. It was only recently that the Bavarian and Baden State railways placed orders for 350,000 tons of rails and sleepers with German manufacturers, and there is every prospect that large quantities of the material, machinery, &c., needed by the German yards will have to be ordered abroad. It might, therefore, be well for American manufacturers to keep in close touch with the German yards, of which a list of the more prominent ones follows below. Up to the present time most of the imported shipbuilding material has come from Great Britain; but British works are as busy as German, and both may have to look to the United States as a necessary source of supply.

The two principal imperial yards (Kaiserliche Werft) are situated at Kiel, and at Wilhelmshaven. The most important private yards are the following, with some particulars as to their character:

F. Schichau, Elbing. War ships of all kinds, ironclads, armored cruisers, gun boats, torpedo boats and torpedo boat destroyers, express and mail steamers of the largest dimensions, tank ships, freight and passenger steamers, ferry boats, for river and sea service; tugs and ice breakers, dredges, hopper barges, up to the largest sizes; yachts, &c. Establishment founded in 1837; 5000 workmen.

Stettiner Maschinenbau-Actien Gesellschaft Vulcan, Bredow, near Stettin. Works founded in 1851. Over 3000 workmen. War ships of all kinds. Turned out many war vessels for the German, Russian, Chinese, Japanese, Greek and other navies. Largest express, mail, passenger and freight steamers, &c.

Howaldswerke, Kiel. Founded in 1838. Steel and iron ships of all kinds and sizes; 2400 workmen.

Blohm & Voss, Hamburg. All kinds of war ships, ironclads, gun boats, mail and express steamers, &c.

Actien Gesellschaft Weser, Bremen. Founded in 1844. Vessels of all kinds; 2000 workmen.

Joh. C. Tecklenborg Aktien Gesellschaft, Geestemünde. Founded in 1840; 1000 workmen.

Reiherstieg-Schiffswerfte, Hamburg. Founded in 1863. All kinds of vessels.

Flensburger Schiffsbau Gesellschaft, Flensburg, 1800 workmen.

Germania Schiffswerft, Kiel. Property of Friedr. Krupp of Essen, 2500 workmen. Build all kinds of war vessels, &c.

Heinrich Koch, Lübeck, 600 workmen.

Aktien Gesellschaft Neptun, Rostock. Merchant steamers for Germany, Sweden, Russia, &c.; 1200 workmen.

Aktien Gesellschaft Oderwerke, Stettin. All kinds of merchant vessels and machinery; 2000 workmen.

W. Klawitter, Danzig. Iron and steel vessels; 700 workmen.

Danziger Schiffswerft & Maschinenbau Anstalt Johannsen & Co., Danzig. Founded in 1856. Steel and iron vessels.

Jos. L. Meyer, Papenburg a. d. Ems. Iron cargo and passenger steamers.

H. Merten, Ges. m. b. H., Danzig.

Many large German concerns are also engaged in the building of river boats. With the betterment and increase of navigable inland German waters, there have also been a development and growth in the building of passenger steamers and cargo boats for the traffic, so that to-day it makes up a very important part of German shipbuilding. Prominent among these yards are:

Schiffs u. Maschinenbau A. G. Vormals Gebr. Schulz & B. Fischer, Mannheim, 360 workmen.

Chr. Ruthof, Castel-Mainz. The largest yards on the Rhine.

E. Berninghaus, Duisburg.

"Kette," Deutsche Elbschifffahrtsges., Uebigau, near Dresden.

Gebr. Sachsenberg, Rosslau an der Elbe, 1000 workmen.

PERSONAL.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, Chicago, Ill., who returned to Europe on the "Kaiser Wm. der Grosse," on July 3, for an extended stay at the Paris Exposition, invites customers and friends of the company who visit the exposition to call on him at their exhibit in the American Machinery Building, Vincennes, in Space 1, Block 9, or at the Palace of Machinery and Electricity, Champ de Mars, Space 1, Block 14, where he will be pleased to meet them and extend any courtesies that will be acceptable in looking up points of interest.

T. M. Nelson, former president of the Pittsburgh Bridge Company, and who became the general manager of the plant when it was absorbed by the American Bridge Company, has resigned the latter office, and has been succeeded by J. C. Munn, former secretary and manager of the Pittsburgh Bridge Company. Mr. Nelson continues with the American Bridge Company in the highway constructing department.

James Gayley of the Carnegie Steel Company has announced his intention to present a completely equipped chemical laboratory to Lafayette College, Easton, Pa., his alma mater. The laboratory will cost $30,000. Henry W. Oliver of Pittsburgh has added to this sum $5000 for the purchase of a technical library, to be attached to the Gayley laboratory.

Archibald Head and G. E. Touch of London, England, were in Cleveland, Ohio, last week on their semi-annual visit as managing directors of the Otis Steel Company, Limited.

Edwin S. Jackman, who has long been Chicago manager of the Park Steel Company, has resigned that position to become sales manager of the Scully Steel & Iron Company, 136 Fulton street, Chicago.

Geo. W. McLean of Geo. A. McLean & Co. of Pittsburgh, dealers in scrap, sailed for Europe on Saturday, July 7.

The Republic Iron & Steel Company contemplate the establishment of large warehouses at Chicago, St. Louis, Cleveland, Cincinnati, Detroit, and perhaps other Western cities, for the more speedy distribution of bar iron and other mill products. Present trade runs largely to immediate shipments, and better facilities for response are deemed advisable.

Central Pennsylvania News.

HARRISBURG, July 9, 1900.—With the sliding downward of prices for raw materials and finished products there has been an appreciable increase of demand all along the line. Some things have occurred during the past week which have greatly stimulated confidence in the situation and encourage the hope that the end of the uncertainty is at hand, and that in a few weeks at most the activity of a year ago will mark the operations of the various plants. Nobody expects prices to get back to the fancy plane to which they soared last year; but thoughtful men are of the opinion that there will be a margin of profit, and with increased business a fair return on the capital invested. It is expected that the Chinese complications will affect the foreign demand somewhat for a time, but that in the end this trouble will prove a blessing in disguise for the manufacturers of the United States.

The National Tube Company have made such arrangements for supplies recently as indicate a purpose to do more business in the near future. The Harrisburg Rolling Mill Company, who furnish skelp for the tube company, will run regularly after this week with a somewhat reduced force.

The output at the Pennsylvania Steel Works during the week just closed was below the average, on account of the shut down over the Fourth. The intense heat also had a tendency to reduce production. One of the blooming mills is not in operation, owing to extensive alterations and improvements being made to the rolls. These improvements are now about completed. The iron and steel foundries continue pressed with orders, and there is no let up in the rush in the bridge and construction, and frog, switch and signal departments. The blast furnaces are producing heavily. Many changes are being made to the tracks in the yards of the company, which will facilitate shipments. Considerable progress has been made on the new mills and extensions of old ones. The foundations for the new steel foundry, 800 feet long, are nearly completed. There is also good headway being made on the buildings for the frog, switch and signal departments.

The Central Iron & Steel Company are operating all but one of the mills of the company, and while the plate business generally has been dull, the high grade of this company's product secures special business.

The Chesapeake Nail Works have shut down for a month. It is not unusual, however, for this plant to close for a short period at this season of the year.

The Susquehanna Iron & Steel Company have felt the drop in the pipe and tube business. Their skelp mills have not been in operation for some time. There was some difference between the company and the National Tube Company as to prices, and as a result of that controversy ther was some talk of the erection of a tube mill to consume the output of the skelp mills at Columbia and York. Recently this talk has been revived, and it is said now that certain gentlemen interested in the Susquehanna Company are willing to invest capital sufficient to erect a tube mill. It is understood that the company have recently booked some nice orders.

It is reported that the Wrightsville furnace will be blown out soon. There is said to be stacked at a neighboring furnace 12,000 tons of pig iron.

The Harrisburg Boiler & Mfg. Company have more orders than men to fill them. This company have found difficulty for several months in getting the skilled men necessary to get out the great amount of work that has pressed in upon them. There have been several foreign shipments. S.

The Lima Locomotive & Machine Company, Lima, Ohio, who build the Shay geared locomotive for use on heavy grades and sharp curves, have increased their capacity 50 per cent. by the addition of new tools, and are operating their works 23 hours per day. The demand has been exceptionally good for the past year, and is without any visible indications of lessening. A number of the Shay locomotives are now being constructed for shipment abroad, while a special 91-ton engine is being erected for the Canadian Pacific Railway for use on some heavy grades of that line.

The Rhode Island Supply & Engineering Company were incorporated July 3, under the laws of Rhode Island for the purpose of buying, selling and dealing in articles of steel, iron, brass, steam and water fitters' supplies, and the fitting up and installing of steam and electric plants. The capital stock of the company is $30,000. They propose to locate in Providence, where they will succeed to the business of Mills, Horton & Reed, the plant of which concern will be greatly enlarged and improved to meet the requirements of the new corporation.

MANUFACTURING.

Iron and Steel.

The Homestead Steel Works of the Carnegie Steel Company closed Tuesday night, July 3, and were idle the balance of the week while repairs were made. The plant resumed Sunday, July 8, at 6 p.m. The Edgar Thomson Works at Bessemer closed July 3 and resumed Thursday morning. The Duquesne Works also closed Tuesday night, July 3, and resumed Sunday night, July 8. The Howard Axle Works in West Homestead were idle only a couple of days.

The Northern Pacific Railway Company have specified Bethlehem nickel steel for the driving axles and crank pins for 20 locomotives now under contract with the Schenectady Locomotive Works, and the Bethlehem Steel Company have booked orders for the forgings in question. The list of railroads using this material is steadily growing, but the company call attention to the fact that those wishing to specify it for locomotive forgings should be careful to designate it as Bethlehem nickel steel, as the reputation gained by it has resulted in the production of imitations which do not show the same high qualities.

At a meeting of the stockholders of the Burden Iron Company June 29 the following directors were elected for the ensuing year: James A. Burden, I. Townsend Burden, John L. Arts, James A. Burden, Jr., and William P. Burden. The directors elected the following officers: President, James A. Burden; vice-president, James A. Burden, Jr.; general manager, John L. Arts; secretary, Nicholas J. Gable.

Furnace F, of the Carnegie Steel Company, at Bessemer, Pa., has been blown out and extensive repairs will be made, which will bring the capacity of the furnace up to 500 tons a day or more.

The puddlers employed by Moorhead Brother & Co. of Pittsburgh, whose wages were cut from $6 to $4.80 a ton, have gone out on a strike, refusing to accept the reduction. The firm state they expect to have little trouble in filling their places.

The Republic Iron & Steel Company have issued an order notifying all salaried men at their Sharon Works, Sharon, Pa., that their services will not be required after July 15. The entire plant is closed and will likely be idle for some time.

In addition to the sheet scale, which will be signed for all the union mills of the American Sheet Steel Company, the following concerns have signed the Amalgamated Association scale: The Champion Iron & Steel Company, Muskegon, Mich.; the Illinois Steel Company, Joliet, Ill.; the Tyler Tube & Pipe Company, Washington, Pa.; the Anniston Rolling Mill Company, Anniston, Ala.

Spang, Chalfant & Co., Incorporated, of Pittsburgh, operating Etna Iron & Tube Works, Etna, Pa., have notified the men employed at their lap and butt weld furnaces of a reduction in wages averaging not quite 10 per cent., to take effect on Monday, July 16. The reduction affects about 600 men. The men have signified their intention to accept the cut, as they received several voluntary advances in wages during the time when prices of tubular goods were advancing.

The Board of Trade of Parkersburg, W. Va., have accepted the plans of the Mercantile Trust Company of Pittsburgh, to erect a new steel plant at Parkersburg. The Board advised the citizens to invest in the $120,000 worth of lots which the Mercantile Trust Company will place on the market, in connection with the proposed new plant.

The Palmer Steel & Iron Company of Muncie, Ind., will have a new 8-inch mill and a new engine to operate the 10-inch mill now at the factory. The plant will resume operations probably about August 1.

One of the Alice furnaces of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., is being practically reconstructed.

The plate mill and nail factory of the Ellis & Lessig Steel & Iron Company, Pottstown, Pa., have been started up after an idleness of three weeks.

The Seaboard Steel Casting Company of Chester, Pa., are enlarging their plant, now in course of construction along the Delaware River front. The company are about to start excavating for a new brick and iron building, one story high, which will be equipped with special machinery.

The new pipe mill of the Reading Iron Company, Reading, Pa., has just been completed and put in operation. It was built expressly for the manufacture of 3 and 6 inch pipe. The firm have had quite a large demand for this class of pipe. The demand for the smaller sizes has not been so active the last month, but orders are now coming in, and it is expected that the trade will improve steadily.

Machinery.

Representatives of the Universal Winding Company at Providence, R. I., were in Woonsocket, R. I., July 3, looking for a site for a new machine shop which they propose to erect in that city. Several properties were inspected. The company have not yet decided whether or not to retain their Providence shop, but it is thought probable that they will.

The Norwalk Pattern & Mfg. Company, South Norwalk, Conn., general iron founders, advise us of their ability to turn out castings of machinery, furnaces, heaters, &c., either from patterns or drawings, they having a well equipped pattern shop in connection with their foundry. They state that particular attention will be paid to high grade jobbing castings.

The M. C. Bullock Mfg. Company, 1170 West Lake street, Chicago, have just shipped a large mine ventilator to West Virginia, a hoisting plant to the Black Hills, another to Spring Valley, a Willans engine to the Massachusetts State Farm, and a large diamond drill equipment to Washington, and have received orders for a hoist for the Mesabe Range, a large diamond drill and outfit for the Balkan States, a large mine ventilator for West Virginia, and a diamond drill for Missouri.

The Standard Pneumatic Tool Company, Marquette Building, Chicago, announce that A. B. Holmes, who has been connected with the company since its organization, has been appointed assistant manager, and will be located at the home office. The company have also opened an office at Pittsburgh, Pa., in room 217, Ferguson Building, and Wm. Jennings will have complete charge there.

La Societa Italo-Svizzera di Construzioni Meccaniche, in Bologna, Italy, manufacturers of turbines and other mechanical appliances, are said to have been the successful bidders for the equipment of certain works in Italy, in which there will be required some $75,000 worth of American tools and machinery.

The Fair Haven (Vt.) Foundry & Machine Company have been incorporated with a capital of $6,000.

An unusually large planer was shipped recently from the works of Caleb Colvin, Worcester. The bed is 96 inches wide between posts, 20 feet long and 60 inches high.

The Rogers & Hemphill Machine Company of Alfred, N. Y., recently shipped one of their largest boring and turning mills to Manchester, England.

Hardware.

Frank Mossberg Company, Attleboro, Mass., manufacturers of bicycle and other bells, report inquiries for punching tools and sheet metal work, which is also a branch of their business, as on the increase. They are adding some new machinery to their plant, and are preparing to at least double their production for next year.

The Elliott & Reed Company, Richmond, Ind., advise us that business in their spring steel fencing has been excellent. They also report receiving some inquiries from abroad for their product. The company are making arrangements to largely increase the capacity of their plant.

The Peck axe factory at Cohoes, N. Y., was destroyed by fire on the 30th ult. The loss was about $40,000, with insurance of $10,000.

D. M. Steward Mfg. Company, Chattanooga, Tenn., makers of crayons, &c., advise us that their foreign trade is holding up very nicely, and they are making new customers in different parts of the world. Their trade among Scottish shipbuilders, for example, is, and has been for the past six months, especially good. Their electric insulator business is also larger than ever before, while trade in gas burners and slate pencils is fully up to the average, and they anticipate a large season, especially for the former.

The Wright & Colton Wire Goods Company of Worcester, Mass., reopened their wire department on the 9th inst., after a shut down of a week. During the week new annealing furnaces were put in, which are slightly larger than the old. All the other departments are running full time and there is a rush in the screw department.

The Summit Wire Company, Cuyahoga Falls, Ohio, have been recently organized with a capital stock of $25,000. Arthur L. Over of Pittsburgh, Pa., is president, and W. S. Fitch is secretary and treasurer. This company have purchased the fine wire and straightening and cutting machinery of the E. A. Henry Wire Company, Cuyahoga Falls, Ohio, also the factories of the Chester Wire Company. New Engines and boilers are being installed and the machinery is being thoroughly overhauled. The capacity on tinned, liquor finished and coppered wires, when the improvements under way are completed, will make these mills rank among the most important in the West.

Miscellaneous.

John Wood Mfg. Company of Conshohocken, Pa., have recently received a number of large orders for Wood's water tube boilers for steel plants, rolling mills, blast furnaces, electric power stations, &c. Orders have also been received for the same boilers by Walsh & Weidner of Chattanooga, Tenn., among them being five 250 horse-power vertical and two 150 horse-power horizontal for the Roane Iron Company of Rockford, Tenn. The Coatesville Boiler Works of Coatesville, Pa., have also received quite a number of orders, as well as Fraser & Chalmers of Chicago, Ill., who are installing these boilers in all parts of the world. Catalogues, blue prints and other information are furnished by the home office—namely, John Wood Mfg. Company, Conshohocken, Pa.

The Warren City Boiler Works, Warren, Ohio, say the past year has been the busiest twelvemonths ever known since they have been in business. They are at present working on several oil tanks ranging from 65 to 100 feet in diameter and 30 to 35 feet high, which they are building for several different oil concerns. They have just dismantled the old Boshart & Wilson plant at Gibson Point, which has been standing for a number of years, and are rebuilding the entire plant, consisting of eight or ten large tanks at Chester, Pa. They have completed a standpipe 25 feet in diameter by 100 feet high, and a standpipe 15 feet in diameter by 150 feet high at Norfolk, Va., and are erecting a large self-supporting smoke stack for Swift & Co., at South St. Joseph, Mo. They are also building a batch of ten 40-ton coal tanks on iron substructure to be used in connection with large boilers fed with automatic stokers. They have increased their facilities for getting out work and are in better shape than ever for handling large contracts.

The stockholders of the Youngstown Heating Company, recently organized at Youngstown, Ohio, have elected the following officers: M. Liebel, Jr., president; H. D. Kaercher, secretary, treasurer and general manager; directors, M. Liebel. H. D. Kaercher, Paul Kaercher, J. C. Bradey, F. H. Wilber. It is stated that this company expect to spend about $60,000 in the building of a plant to manufacture their heating apparatus. The Holly system of conveyance of steam has been adopted, and a contract has been let to the American District Steam Company of Lockport, N. Y., for the building of the system.

The South Shore & Boston Electric Railroad Company have purchased the large foundry at East Weymouth, Mass, and it will be used to manufacture cars and to repair cars of the company.

The Austin-Bryan Mfg. Company, Ensley, Ala., have been organized with a capital of $75,000 for the purpose of building machinery, engines, boilers and agricultural implements. A plow factory is now being erected.

The Rollins Flue Cleaner Company, Albany, N. Y., have been incorporated with a capital of $4,000.

The American Car & Foundry Company recently received the following contracts: Three hundred coal cars for the Cleveland, Cincinnati, Chicago, and St. Louis; two passenger cars for the New Orleans and Northwestern; 35 box and 65 flat cars for the Shreveport & Red River Valley; 175 coal cars for the El Paso & Northeastern, and 200 mining and 65 flat cars for the Delaware & Hudson.

Lathrop & Shea of New Haven, Conn., have received the contract for the construction of the six miles of railroad which will connect the new Buffalo plant of the Lackawanna Iron & Steel Company with the tracks of the other railroads. It is stated the work will be rushed and that the contract calls for the completion of the road within three months after the acceptance of the proposal.

The Union Rolling Mill & Foundry Company, Denver, Col., have been incorporated with a capital of $100,000. The company will do a general foundry business.

A Novelty in Steel Making.—A correspondent of *Ironmongery*, of London, states that some few months back, in the crucible house of the metallurgical department of University College at Sheffield, England, there was melted and cast probably the most expensive steel ingot that has been made in Sheffield. A steel was required to contain 22 per cent. nickel, 3 per cent. palladium, with carbon practically *nil*. Twelve and a half pounds of 25 per cent. nickel steel scrap were charged into the crucible and clear melted, then 6.32 ounces of palladium sheet (value $291) were added to the charge. As dead mild steels occasionally find their way through the bottom of the crucible before they are ready to pour, the final stages were watched with almost breathless interest. The whole operation was, however, successfully completed, and the ingot rolled and drawn into wire. The cost of this experiment was not, of course, defrayed by the college funds.

The July report of the Department of Agriculture shows a reduction in the estimated harvest of spring wheat, as compared with a month ago, of 102,000,000 bushels and of 7,000,0000 bushels in winter wheat, or a total reduction of 109,000,000 bushels. The estimate of the total wheat yield this year indicates a crop of 510,356,000 bushels, as compared with an actual harvset of 547,304,000 bushels last year.

On the 7th inst. the various mining camps in Alabama held meetings and ratified the action of their State convention of the past week in accepting the terms of the operators and making a wage contract for the year commencing July 1 on the basis of last year's contract. Work at many of the mines had already been resumed, and seven blast furnaces which banked fires pending adjustment of the wage question are also resuming. The strike threatened to be a very serious interference with Southern industries, and it is fortunate that it has been settled with so little loss of time.

The Iron and Metal Trades.

The situation has not been improved by the conferences of officers of large Pig Iron and Steel producing companies held in this city the past week. Efforts were made to secure some kind of an agreement relative to prices on Bessemer Pig Iron and on Steel, but the conferences resulted in leaving the market open. Severe reductions have since been made in prices, and information received from Pittsburgh is to the effect that Bessemer Pig Iron has been offered at $16 and Steel Billets at $20, without bringing out any considerable amount of business. This must be acknowledged to be discouraging, as it had been supposed that such prices as these would surely invite the placing of numerous orders. It now appears that the leading Steel companies are endeavoring to arrange with the independent manufacturers of Bessemer Pig Iron to restrict production, the former agreeing to cut down the output of Steel if the latter will on their part reduce the production of Pig Iron. Action of this kind may relieve the market considerably and prevent a further decline in prices.

The Western demand for Finished Steel products has been somewhat stimulated by further reductions in Bars and Tank Plates which have evidently brought prices in these lines down to the views of consumers. Good ground prevails for the hope that bottom is at last in sight, and that the postponed business so long discussed is materializing. Inquiries are increasing, and the time is certainly fast approaching when consumers generally must come into the market to cover their requirements. The business of the country is not coming to a complete standstill, and the consumption of Iron and Steel will reach large figures during the next 12 months, probably not very much under those of the past like period.

Our figures showing the condition of blast furnaces on July 1 indicate that the production of Pig Iron is being adjusted to meet the changed conditions in the Iron trade. The active furnaces represented a total weekly capacity of 283,413 tons, against 296,376 tons on June 1, showing a reduction of 12,963 tons, which is at the rate of 675,000 tons a year. This is an important reduction, but it is likely to be exceeded the present month, as furnaces are still being put out of blast. Stocks of Pig Iron are increasing, furnaces reporting to us having now 86,558 tons more on hand than on June 1. This is a situation which can easily be changed, with the rapid restriction of production now in progress.

An important meeting of the Structural Steel manufacturers was held Wednesday at the Holland House, New York. It had been expected that a reduction in prices would be made, but the manufacturers decided that prices are low enough and that they would make no further reduction. They take a hopeful view of this branch of trade, and believe that to reduce prices at this time would check business instead of encouraging it.

The most important occurrence in the Metal trade the past week was a reduction in the price of Pig Lead. The fluctuations in this metal have recently been rapid, and have completely mystified the trade.

A Comparison of Prices.

At date, one week. one month and one year previous.

Advances Over the Previous Month in Heavy Type Declines in Italics.

	July 12, 1900.	July 5, 1900	June 13, 1900.	July 12, 1899.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	*$16.75*	$17.00	$19.00	$19.50
Foundry Pig, No 2, Southern, Cincinnati	*17.00*	17.75	19.25	17.75
Foundry Pig, No. 2, Local, Chicago.	*18.50*	19.00	21.00	18.50
Bessemer Pig, Pittsburgh	*16.00*	18.00	19.90	20.75
Gray Forge, Pittsburgh	*16.50*	16.50	17.50	17.50
Lake Superior Charcoal, Chicago	*22.00*	22.00	23.00	21.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*20.00*	25.00	28.00	33.00
Steel Billets, Philadelphia	*25.00*	27.50	30.00	34.50
Wire Rods, Western Mill	*35.00*	35.00	36.00	
Steel Rails, Heavy, Eastern Mill	35.00	35.00	35.00	28.00
Spikes, Tidewater	2.15	2.15	2.15	1.90
Splice Bars, Tidewater	*2.00*	2.00	2.15	1.80
OLD MATERIAL:				
O. Steel Rails, Chicago	*11.00*	11.00	12.00	15.00
O. Steel Rails, Philadelphia	*13.00*	nom	17.00	16.00
O. Iron Rails, Chicago	*14.00*	14.00	15.00	18.50
O. Iron Rails, Philadelphia	*15.00*	nom	17.00	20.00
O. Car Wheels, Chicago.	*18.00*	18.00	20.00	15.50
O. Car Wheels, Philadelphia	**19.00**	nom	18.00	16.00
Heavy Steel Scrap, Chicago	*10.00*	10.00	12.50	18.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.45*	1.50	1.60	2.00
Common Iron Bars, Youngstown	*1.35*	1.40	1.60	1.85
Steel Bars, Tidewater	*1.45*	1.50	1.70	2.10
Steel Bars, Pittsburgh	*1.15*	1.35	1.50	2.00
Tank Plates, Tidewater	*1.45*	1.45	1.60	2.60
Tank Plates, Pittsburgh	*1.15*	1.35	1.40	2.40
Beams, Tidewater.	*2.05*	2.05	2.40	2.15
Beams, Pittsburgh	*1.90*	1.90	2.25	2.00
Angles, Tidewater	*1.95*	1.95	2.40	2.15
Angles, Pittsburgh	*1.80*	1.80	2.25	2.00
Skelp, Grooved Iron, Pittsburgh	*1.85*	1.40	1.50	2.15
Skelp, Sheared Iron, Pittsburgh	*1.30*	1.45	1.60	2.35
Sheets, No. 27, Chicago	*3.10*	3.10	3.20	3.05
Sheets, No. 27, Pittsburgh	*2.90*	2.90	3.00	3.00
Barb Wire, f.o.b. Pittsburgh.	2.80	2.80	2.80	2.95
Wire Nails, f.o.b. Pittsburgh	2.20	2.90	2.20	2.35
Cut Nails, Mill	*1.95*	2.05	2.05	2.05
METALS:				
Copper, New York	*16.25*	16.25	16.37½	18.25
Spelter, St. Louis	*4.10*	4.10	4.25	5.90
Lead, New York	**4.00**	4.12½	3.75	4.55
Lead, St. Louis	**3.95**	4.07½	3.75	4.45
Tin, New York	**32.25**	31.30	30.00	27.87½
Antimony, Hallett, New York	9.62½	9.62½	9.62½	10.00
Nickel, New York	55.00	55.00	55.00	38.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.84	4.84	4.84	.....

Chicago. (*By Telegraph.*)

Office of *The Iron Age*, 805 Fisher Building.
CHICAGO, July 11, 1900.

The extremity to which buyers are driven by the unending declension of values has been shown this week by the quite large number of requests to producers and sellers that prices named in response to inquiries be guaranteed against further reduction. The requests are, of course, not granted, and, as a consequence, the applicants retire from the field without closing for their wants. They are not convinced that the propitious occasion has arrived for placing their orders. And as values are slaughtered day after day, solicitude concerning these coming needs grows in intensity. Prices are dropping a little too fast to suit even the purchasers, for they are beginning to argue that a level excessively low means the recurrence of a subsequent level excessively high. The volume of business done at Chicago this week shows a notable gain over recent aggregates for the same period. A few orders placed venture into the future one, two or three months, but most of them continue to represent only the immediate requirements of the purchasers. Inquiries, however, for the last half of the year are greatly in excess of anything of like nature for months past.

Pig Iron.—One of the inquirers for Pig Iron within the past week says the bids he received for practically the same Iron and from the same district varied $2. The difference was greater than he had ever before experienced. This incident shows the present uncertainty of values. The range is a little lower than a week ago, but, notwithstanding that fact, the tone of the market seems a little stronger This may be due to the much better inquiry, which gives promise of early buying. Several forerunners of coming activity were in the shape of inquiries for Iron deliveries to run to next June. The prospective buyers are Implement makers of medium rank in point of output, who are accustomed with this season of the year to buy for that period ahead. But it is to be observed that the purchases have not yet been made for that extended period, although some business has been closed for shipments through three ensuing months. There is among both buyers and sellers a strong wish to find where the coming market is to be, and the

lack of information seems to be as profound with the one factor of trade as with the other. It seems to depend upon the market conditions as they develop from day to day. One local furnace, which has been marketing its stock because of insufficient space wherein to store it, has practically retired from the market. There are contined stories of extensive closing of furnaces, both East and South, from various causes, and the prices at which the current trade is going are not participated in by some large factors of production. Furnaces in the West this week are perhaps a little more generally in operation. The volume of sales of Pig Iron is improving, though the trade is mainly for the same small quantities that have constituted the market for months past. One lot of 2000 tons for Pipe manufacture is said to have been bought. Corrected quotations are as follows:

Lake Superior Charcoal	$22.00 to $23.00
Local Coke Foundry, No. 1	19.00 to 19.50
Local Coke Foundry, No. 2	18.50 to 19.00
Local Coke Foundry, No. 3	17.50 to 18.00
Local Scotch, No. 1	19.00 to 20.00
Ohio Strong Softeners, No. 1	20.00 to 21.00
Southern Silvery, according to Silicon	21.35 to 22.35
Southern Coke, No. 1	19.35 to 20.35
Southern Coke, No. 2	18.35 to 19.35
Southern Coke, No. 3	17.35 to 18.35
Southern Coke, No. 1 Soft	19.35 to 20.35
Southern Coke, No. 2 Soft	18.35 to 19.35
Foundry Forge	17.85 to 18.85
Gray Forge and Mottled	16.85 to 17.85
Southern Charcoal Softeners, according to Silicon	21.35 to 22.35
Alabama and Georgia Car Wheel	22.85 to 23.85
Malleable Bessemer	20.00 to 21.00
Standard Bessemer	21.50 to 22.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon	26.00 to 27.00

Bars.—Competition in Steel Bars has been active and prices are lower. Quotations are heard as low as 1.45c. from mill. Iron Bars have also been reduced to from 1.45c. to 1.55c., to meet the price. The inquiry for Iron Bars is less, perhaps, on account of the extensive purchases prior to July 1, in anticipation of the closing of mills. Mill trade, however, suffers somewhat from the quite active store trade, induced by the prompt deliveries secured and the steady recession in values of late. From store common Iron Bars are quoted 1.75c., and for Steel that price has been shaded. Hoops and Bands are quoted 2.25c. to 2.40c. from store.

Structural Material.—There is a more general interest shown in Shapes by possible customers. It has not reached the buying point to any notable degree, but gives employment to prospective sellers. Most of this renewed inquiry is for small tonnages, comparatively, but a few moderately large transactions are under advisement, including a Milwaukee structure requiring about 2000 tons and a fair amount of Bridge work. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 2.05c.; 18 inches and over, 2.15c.; Angles, 3 inches and over, 1.95c.; Angles under 3 inches, 1.60c.; Tees, 2.10c.; Universal Plates, 1.50c. to 1.60c. From local yards small lots of Beams and Channels are quoted 2.55c. to 2.75c.; Angles, 2.20c. to 2.30c. rates, and Tees, 2.40c. to 2.60c.

Plates.—The rebuffs administered to buyers of Plates by the shrinking quotations tend to keep them away, but a certain amount of business is unavoidable, and just that amount is now in progress. It is fairly large, but does not give the mills engagements into the future. Prices continue weak. Tank is quoted 1.50c. to 1.60c., and Flange 1.80c. to 1.90c. From store Tank is quoted 1.80c. to 2c., and Flange, 2.10c. to 2.20c.

Merchant Pipe.—There is better inquiry from consumers of Pipe, and the jobbers also are buying somewhat more freely. Altogether the trade is noticeably better, though the late reduction is, perhaps, too close to thoroughly imbue buyers with confidence of permanent stability. Prices in carloads are as follows:

Sizes.	Black.	Galvanized.
⅛ to ½ inch and 9 to 12 inches	61 2-10	48 2-10
¾ to 8 inches	66 2-10	53 2-10

Sheets.—Inquiry is moderate this week, though a fair volume of trade is current in the aggregate. Galvanized Sheets are somewhat lower, quotations from store ranging from 70 and 5 to 70 and 10. Black Sheets are steady at 3.50c. to 3.55c. from store.

Merchant Steel.—Consuming manufacturers, while still in doubt as to the buying dimensions of the Western trade this coming season, are more disposed to enter into contracts for material, and this week sellers have been quite busy answering inquiries. Most of the work so far accomplished has been preliminary, but betokens a good trade in the early future. Prices are unchanged. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 2.10c. to 2.20c.; Open Hearth Spring Steel, 2.75c. to 3c.; Toe Calk, 2.75c. to 3c.; Sleigh Shoe, 2c. to 2.25c.; Cutter Shoes, 2.75c. to 3c.; Ordinary Tool Steel, 7c. to 7½c.; Special, 13c. and upward.

Rails and Track Supplies.—There is this week little new inquiry for Standard Sections, though in small lots Light Rails are meeting with success from various sources. Nominally prices are as follows: Rails are $35 to $37 for Standard Sections, and $32 to $34 for Light Rails. Spikes are quoted 2c. to 2.10c.; Bolts, with Hexagon Nuts, 2.75c. to 2.90c.; Square Nuts, 2.65c. to 2.75c.; Links and Pins, Steel or Iron, 2.25c. to 2.50c.

Old Material.—Large dealers are slowly regaining their lost courage. Prices are the lowest on some grades for many years and transactions have been closed at prices below those quoted, but in the absence of any buying from consumers each transaction is independent and a wide variance of quotations is noticed where any grade is active enough to command many transactions. Offerings continue large, low values having no perceptible influence in diminishing primary stocks. The following are approximate quotations per gross ton:

Old Iron Rails	$14.00 to $15.00
Old Steel Rails, mixed lengths	11.00 to 12.00
Old Steel Rails, long lengths	12.00 to 13.00
Relaying Rails	20.00 to 22.00
Old Car Wheels	18.00 to 19.00
Heavy Melting Steel Scrap	10.00 to 11.00
Mixed Steel	8.00 to 9.00
Iron Fish Plates	12.00 to 13.00
Steel or mixed do	11.00 to 12.00
Iron Car Axles	16.50 to 17.50
Steel Car Axles	15.00 to 16.00
No. 1 Railroad Wrought	12.00 to 13.00
No. 2 Railroad Wrought	11.00 to 12.00
Shafting, Iron and Soft Steel	15.00 to 16.00
No. 1 Wrought	11.00 to 12.00
No. 1 Country Wrought	10.00 to 11.00
No. 1 Mill	8.00 to 8.50
No. 2 Mill	6.00 to 7.00
No. 1 Busheling	9.00 to 9.50
No. 2 Busheling	8.00 to 8.50
Iron Car Axle Turnings	9.00 to 10.00
Soft Steel Axle Turnings	8.50 to 9.50
Machine Shop Turnings	6.50 to 7.00
Wrought Drillings	6.00 to 6.50
Cast Borings and Drillings	5.00 to 6.00
Mixed Borings and Turnings	5.00 to 6.00
No. 1 Boilers, cut	10.00 to 11.00
No. 2 Boilers, cut	6.00 to 6.50
Boiler and Ship Scrap	12.00 to 12.50
No. 1 Cast	10.00 to 11.00
No. 2 Cast	7.00 to 8.00
Railroad Malleable Cast	10.50 to 11.00
Agricultural Malleable Cast	9.50 to 10.00

Metals.—Lead has been reduced this week to 3.95c. for Desilverized and 4.05c. for Corroding in 50-ton lots. Buying is moderate. Copper is fairly active at unchanged quotations, 16½c. for Lake, and 16¼c. for Casting.

H. R. Durkee, at one time prominent in the Western Iron trade, but of recent years engaged in other lines, has opened an office for the sale of Pig Iron at 115 Dearborn street, Chicago.

Philadelphia.

Office of *The Iron Age*, Forrest Building,
PHILADELPHIA, PA., July 10, 1900.

The Iron and Steel market is just as difficult to diagnose to-day as it has been at any time for months past. Prices are as unsettled as they have ever been, and as yet there are no signs whatever that the end has been reached. After such a serious and continuous decline in prices as there has been during the past six or eight months, it would be unreasonable and contrary to all former experience to expect it to go much further. Nevertheless, movements in the Iron trade usually do take a wider swing than people calculate upon. The depression and the era of low prices from 1893 to 1898 extended over a longer period than any one expected. The extraordinary advance in prices during 1899 and the decline during the first half of the present year covered an extraordinarily wide range in prices, although the time in which it was done was very limited compared with previous movements of a similar character. The point which the trade wants to get at now, however, is: How much more decline is there going to be, and how much longer before business assumes its normal condition? These questions are difficult to answer, and cannot be answered until supply and demand are properly adjusted. First, it must be found out how much iron is likely to be wanted, and, second, how much we are producing. This takes time to develop, and this no doubt is the reason for the weakness in prices. It is clear that the maximum consumption has been reached. The question now is, how far back must the pendulum swing before the return movement sets in? These are problems which cannot be solved except by time and actual experience, but in the meantime there are many strong concerns which can run along at prices which would be simply ruinous to others, and they are not going to stop simply to help those who are less favorably situated. The demand has got to fix the price. With a 14,000,000 ton consumption, $20 to $25 appeared to be fair average figures for Pig Iron; with a 13,000,000 ton consumption it may be $15 to $18; with a 12,000,000 ton consumption it

may be $12 to $14. Under these circumstances it is hardly possible, and hardly reasonable, to expect any one to say how far we are from bottom prices, or how soon or how long it will be before there is an active market. The question is too big to be answered, except by the development of conditions which at present are absolutely problematical. It may be said that business is getting ready for a new start, but it will have to be on a new basis of prices, and under new conditions. The pace was too fast in 1899, but a similar development of business during 1901 is not improbable, but on more conservative lines, and therefore with more chances of permanency.

Pig Iron.—Nothing can be said in regard to Pig Iron except that prices are lower, and buyers are still disposed to limit their operations to immediate requirements. The decline has gone far enough to excite some little interest, and in some cases large buyers are feeling around to see what is the best that can be done for the last quarter of 1900, intimating that if prices are made low enough they might place good sized orders. There has been so much hesitation and so many disappointments that sellers of Iron never feel sure of anything until the contract is actually signed, and even then it is liable to revision. At the moment about $17.50 is usually quoted for Standard No. 2 X Foundry, but all sorts of prices are mentioned from $18 down to $16. It is an open market and every man makes his own price, which, of course, varies according to circumstances. There is a more hopeful prospect as regards demand, and it is believed that a good deal of business will be closed before the end of the month, although it is not unlikely that it will be at lower figures than are quoted at the present time, which for city or nearby deliveries are about as follows: No. 1 X Foundry, $18 to $18.50; No. 2 X Foundry, $16.75 to $17.75; No. 2 Plain, $15.50 to $16.50.

Billets.—No business reported except in small lots and for special qualities. Ordinary Soft Steel has been offered at $25 for 1000-ton lots, but buyers made no response.

Plates.—Business is fairly active and a few pretty good sized orders have been placed, but at extremely low prices. One order for several hundred tons consisting of Sheared and Universal Plates in equal quantities was taken at less than 1.40c., but for the usual run of orders 1.45c. to 1.50c. is quoted. Work is scarce at some of the mills, and the immediate outlook is not particularly encouraging, although it is believed that a little later on in the season there is a fair chance of renewed activity. The usual asking prices for carload lots and upward is about as follows, for deliveries in buyers' yards: Steel Plates, ¼-inch and thicker, 1.45c. to 1.50c.; Universals, 1.45c. to 1.50c.; Shell, 1.60c. to 1.65c.; Flange, 1.70c. to 1.75c.; Charcoal Iron Plates, C. H. No. 1, 2.60c.; Best Flange, 3.10c.; Fire Box, 3.60c.

Structural Material.—There is nothing of importance on the market at present, although the mills are pretty fairly situated as regards work for the immediate future. Prices are supposed to be unchanged, but there is an impression that the market is liable to become an open one at any moment. There is no particular reason for this except that as everything else seems to have broken loose, Shapes will have to follow suit. Nominal prices, however, are as follows for seaboard and nearby points: Beams and Channels, 15-inch and under, 2.03c.; Angles, 3 to 6 inches, 1.93c.

Bars.—Business is hard to put through in anything like good sized lots, and prices are again lower. The usual quotation is 1.40c. at mill for Refined Bars, but business has been taken at less money, and there is no certainty that even these low figures will be maintained for any length of time, as there is not much demand at the present time. Steel Bars irregular at 1.45c. to 1.55c.

Sheets.—The demand has been quite fair considering the time of year, and inquiries received during the past few days indicate a considerable business in prospect for the near future. The mills expect to start up on Monday, having been closed since the last of June. Prices are about as follows for best Sheets (Common Sheets two-tenths less): No. 10, 2.30c.; No. 14, 2.40c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

Old Material.—There is absolutely no market at all, but material could be had in large quantities at the following prices for deliveries in buyers' yards. Very few mills are taking anything in at present, however, so that prices are practically unquotable at the present time: Choice Railroad Scrap, $15 to $16; No. 1 Yard Scrap, $12 to $13; No. 2 Light Scrap, $10 to $10.50; Machinery Cast, $13 to $14; Heavy Steel Scrap, $12 to $13; Old Iron Rails, $15 to $16; Old Steel Rails, $13 to $14; Wrought Turnings, $9 to $9.50; Cast Borings, $7.50 to $8.50; Old Car Wheels, $19 to $20; Iron Axles, $16 to $17; Steel Axles, $16 to $17.

Cleveland.

CLEVELAND, OHIO, July 10, 1900.

Iron Ore.—A decided change was noted in the movement of Ore down the lake this week. Heretofore, since the tie up of the Bessemer Steamship Company fleet, the shippers have been compelled to depend upon small tonnage to move their wild stuff. The supply of this was liberal owing to a fight that has prevailed between the lumber shippers and the vessel owners, as a result of which the small tonnage was turned into the Ore trade. Now the lumber movement is beginning to increase and the small tonnage is being withdrawn from the Ore trade to some extent, but another war between owners and shippers, that on the movement of coal to Duluth, has taken the place of the other, which is having the result of sending a good many of the boats back to the head of the lake light, thereby increasing the dispatch of them. This also increases the number of boats in the Ore trade. The result is that the shippers are now getting tonnage that is of the regulation Ore carrying size, with which to move their wild cargoes. The boats secured this week have ranged between 2000 and 5000 tons carrying capacity, and the lists of charters show that no few of them have been on the market looking for a load. The retiring of the Rockefeller whaleback fleet left about 2,000,000 tons of wild Ore to be brought down the lake, if the movement proves to be what is now expected it will be, 18,000,000 tons. This Ore has been moving steadily but slowly hitherto, but with the advent of the larger steamers into the trade it promises to be shipped at a faster rate. The reports of the commerce that has passed through the "Soo" canal, from the opening of the season of navigation up to July 1, have just been compiled. These show that the shipment of Ore from Lake Superior points has been 5,475,267. A report covering a similar period last year shows this year's shipment to be in excess of the former by 1,557,592 tons. So far no method has been discovered by which Government officials can make a similar report of the Ore which comes down from Lake Michigan ports, but those who have kept a close watch upon it assert that it has been correspondingly heavy. This being the case, considering the natural difference between Lake Michigan and Lake Superior as Ore producing points, it would be safe to assert that the shipment of Ore to date is in excess of that which came down the lakes during a similar period last year by 2,000,000 tons or better. If the shipment of Ore this year is to be about equal to or a little less than it was last year the shippers are to be able to move it down the lakes at easy stages from now on. The season is about one-third gone, and the shippers have about one-half of their Ore down, or an amount slightly less than that. The shipment of that stuff will be no serious problem, consequently the vessel owners will hardly be in a position at any time this year when they can force a change of rates on the shippers. Charters which have been made during the last few days show that the old rates obtain. These are $1 from Duluth and head of the lake ports; 90c. from Marquette, and 70c. from Escanaba.

Pig Iron.—This week has seen a slight falling off in the movement of Pig Iron, owing to the strike among the machinists. This was embarrassing to the furnacemen, who had counted on getting rid of a good deal of their stock during the time they were shut down for invoice and repairs. As a consequence of this circumstance the week has been rather dull. The sales that have been made have been of carload lots, and they were less than during the weeks just preceding. The same tendency, as has shown itself for two or three weeks, pervades the market. This is the disposition on the part of the buyers to take in no more than will cover their immediate needs. They seem to be waiting, as the Steel market was some time ago, for the price to settle, or for conditions to develop that will indicate the amount of business that is to be done the last half of this year. If either one of these questions were settled the market might show an entirely different face. As it is the buyers are waiting, and while they wait they are buying lightly and are asking that their Iron be sent to them as rapidly as it is possible for the furnaces to move it. There is little or no talk of business for the future. If this should be talked of the furnacemen would be at a loss to know what price to quote. No figure has even been hinted at that would intimate how Pig Iron is to be sold the last half of this year, but the general tendency seems to be to a much lower price. It may be that before the bottom price on Iron has been reached that commodity will be about back to the basis on which it was a year ago at this time. There is a disposition in the Iron market, as in other branches of the same trade, to allow competition to fix the price, and, if this is done, without the product being curtailed, the outlook for the

producer is none too bright. Bessemer producers have seen but little demand for their product so far. They have a large surplus on hand, and it is accumulating rapidly. A few of the furnaces have gone out of blast for repairs, but this curtailing of the product is not going to affect the market seriously, owing to the fact that the demand for that Iron has been so light heretofore. With a large surplus on hand and with the furnaces producing the Iron all the time the prospect for stiff prices is anything but bright. In fact, the general impression is that they must go down unless some of the furnaces close down to prevent such a slump. A movement of this sort is, of course, already in prospect. When it will materialize is a question. As a general thing it might be said that the Pig Iron market is weak.

Finished Materials.—On Thursday last a meeting of Steel men was held in New York at which it was agreed that hereafter there should be an open market, all agreements as to prices being called off, the law of supply and demand being the only dictator which shall be listened to. It had been noticed that the business, while it was getting brisker, was not as lively as it might be, nor as the mill men would like to have it, hence it was deemed advisable to take such a step. The Steel men expect as a result of this move that the business will increase considerably, as soon as they have had time to feel the pulse of the market and make such changes in prices as the indications shall dictate. The one article excluded from this decision was Beams and Channels. It was at first thought necessary to include that branch as well, but a general discussion brought out the fact that there is a sufficient demand for this material to allow a combination rate to be effective. In taking this stand the Steel men made a virtual confession that the business along other lines has been noticeably light, and that something must be done to quicken it. At all events this condition prevailed, and it was thought as well to acknowledge it. The first effect of this movement was seen in the price of Billets, which has dropped from $28 a ton to below $25. Just how much lower than that it has gone is not told, but the market is very weak and the buyers have it about their own way. This is the second material reduction recently, and it seems that the commodity has not found its level altogether yet. Plates also have suffered another reduction, being quoted now at 1.35c., with some quotations being as low as 1.30c., although the amount of business done at the lower figure is limited, the standard mills refusing to take less than 1.35c. Bars are off also, but this cannot be attributed to the decision of the Steel men, as they were being quoted at a lowering price even while the agreement stood. The law of supply and demand has been working havoc with the price of Bars lately, no business, or practically none, being done. The price of Rails and Structural Material is holding firm, there being an excellent market for both. The abolition of the agreement on these will hardly affect their price at once, as they are on a basis at which a good deal of business can be done. The lowering of prices seems to have had an invigorating effect upon the market generally, for more business is now being done than at any time in two months. The activity, while being most marked in the Structural Steel trade, does not confine itself to that by any means. A vast deal of bridge work is being done, and all of the bridge companies are busy, taking big tonnage. Last Saturday the Wheeling & Lake Erie Railroad was bidding for material for bridges on which the contracts amounted to between 500 and 600 tons of Steel. The King Bridge Company have also taken any number of big contracts of late, on which some big orders will be placed in a short time. Captain John Mitchell is soon to build another new Steel steamer, that will require a good deal of Steel. The order for this has not been placed, although it was expected that the sale would be made last week.

Old Iron.—The leveling process on prices of Old Iron is going on the same as it has on all other commodities. The prices have been materially reduced in the last few weeks, until now they have reached a stage that is about on a par with new material. The sales in consequence have been heavy, and promise to be even heavier. Inquiries for stuff indicate a brisk market soon.

The Thomas Carlin's Sons Company of Allegheny, Pa., have nearly completed a new steel frame foundry, 90 x 180 feet, equipped with two 20-ton electric traveling cranes built by Pawling & Harnischfeger, Milwaukee. A 30-inch cupola of the company's own make will be installed. The new foundry is well located as regards shipping facilities and will have modern equipment throughout. The business of the company had grown to such large proportions that a material enlargement of the melting capacity had become imperative.

Cincinnati. *(By Telegraph.)*

Office of *The Iron Age*, Fifth and Main streets,
CINCINNATI, July 11, 1900.

The dullness of the past week's market for Pig Iron has been even more pronounced than it was the preceding week. Each day as it passes seems to make a new record in the slow race now being run on the Pig Iron track. Buyers and new business are things only within the recollection of the older traders. Hope still lives, however, and as usual has out her pencil figuring out a strong condition "statistically" and promising big things when the present political canvass has been closed. The few strong inquiries, which, like sunbeams in a dungeon, seem out of place, appear prompted only by idle curiosity and are productive of no business. Prices are again lower, just how much it is very hard to determine. Rumor has it that they are lower by 50c. than those given herewith as authentic. Freight rate from Birmingham is $3.25 to this point, from the Hanging Rock district $1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$18.00 to $18.25
Southern Coke, No. 2	17.00 to 17.25
Southern Coke, No. 3	16.00 to 16.25
Southern Coke, No. 4	14.50 to 15.00
Southern Coke, No. 1 Soft	18.00 to 18.25
Southern Coke, No. 2 Soft	17.00 to 17.25
Southern Coke, Gray Forge	14.50 to 14.75
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1	.... to 25.00
Ohio Silvery, No. 2	.... to 24.00
Lake Superior Coke, No. 1	.... to 18.00
Lake Superior Coke, No. 2	.... to 17.00
Lake Superior Coke, No. 3	.... to 16.00
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel, Chilling Grades	$23.00 to $23.50
Standard Southern Car Wheel, No. 2	22.00 to 22.50
Lake Superior Car Wheel and Malleable	.... to 23.75

Old Materials.—After a very dull week the price-list is rather uncertain, though nominally unchanged. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $11 to $12; Cast Railroad and Machine Scrap, $9.50 to $10; Iron Axles, $17 to $18; Iron Rails, $14 to $15; Car Wheels, $16 to $17, all quotations per gross ton.

Plates and Bars.—Prices are all lower, though at this writing the exact figures are not attainable.

St. Louis *(By Telegraph)*

Office of *The Iron Age*, 1205 Chemical Building,
ST. LOUIS, July 11, 1900.

Pig Iron.—Orders for spot Iron are heard of occasionally, but more ink dries up in the wells than is consumed in recording transactions. Many Stove founders have ceased operations and Iron has suffered a proportionate reduction in consumption. Inquiries are few and illusive. When followed up it is found that some result from a natural desire on the part of correspondents to keep posted on the market. Representatives are not straining themselves to make sales, but show a strong inclination to become Izaak Waltons. There seems to be no uniformity in prices made by representatives accredited to St. Louis, nor are the quotations always on a parity with those at other centers. In fact, the sales that are brought to a head bear prices reflecting the furnace conditions or the buyers' need for the tonnage and grade specified. The principal company, as previously mentioned in these dispatches, are well sold up on Foundry grades, and are adhering to higher prices. It has been clearly demonstrated in this market that the quoting of a lower price is more inclined to ward off a purchase than bring one about. We quote f.o.b. St. Louis:

Southern, No. 1 Foundry	$19.25 to $20.50
Southern, No. 2 Foundry	18.25 to 19.25
Southern, No. 3 Foundry	17.25 to 18.25
No. 1 Soft	19.25 to 20.25
No. 2 Soft	18.25 to 19.25
Gray Forge	16.25 to 17.25

Bars.—The jobber is again benefiting by shut down of mills, as the latter are not in position to furnish full assortments to large buyers for spot delivery. The market is reported by dealers as of firmer tone. Tonnage in action is of moderate quantity. Mills hold both Iron and Steel at this center at 1.60c., half extras, East St. Louis. Jobbers quote in the neighborhood of 1.90c. to 2.10c., full extras, dependent on specifications.

Rails and Track Supplies.—Considerable inquiry for Heavy Sections, but no sales mentioned. Light Rails are in quite good sale. We quote Splice Bars, Iron or Steel, 1.90c. to 2.25c.; Track Bolts, with Square Nuts, 2.55c. to 2.70c.; with Hexagon Nuts, 2.70c. to 2.80c.; Spikes, 2c. to 2.10c.; Links and Pins, 2.40c.

Pig Lead.—The trade has practically thrown up its hands as a result of Monday's reduction in price of De-

silverized to 3.95c. No one seems to know why the price was again changed, but it is freely admitted that the market has been stunned by the tactics which are being pursued. Nearly all Missouri producers have withdrawn. Lead Ore fell off $2, and sold at $46 per net ton. It is quite likely that this week's cut on Pig Lead will have an equal effect on Ore.

Spelter.—Slightly lower in tone. Offerings at under 4.10c were not accepted. In absence of sales, however, the price remains nominally at figure mentioned. Affairs in China are said to have depressed the European Spelter markets, with resultant sympathetic effect here. Zinc Ore was stationary at a top price of $26 per ton.

De Camp Bros. & Yule, Pig Iron factors; the St. Louis Blast Furnace Company and Logwood, De Camp & Co., agents for Frick's Crushed Coke, have removed from the Fullerton Building to the Union Trust Building, St. Louis. The new quarters consist of the entire west wing of the seventh floor, which has been rearranged for the convenience of these firms.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, July 11, 1900.

(By Telegraph.)

Pig Iron.—At the meeting of the Pig Iron and Steel interests held in New York Thursday and Friday of last week it was decided to throw the market open on Pig Iron and Steel. Since that time there has not been enough business done to fix a price on Iron, but some feelers have been put out and $16 at Valley furnace for Bessemer Iron has been quoted. However, there is no tonnage offering, but if a buyer came in the market for a round lot of Bessemer Iron, say 20,000 or 25,000 tons, $15 at Valley furnace might be done, or perhaps lower. As yet there have been no inquiries large enough to bring out such low prices. A scheme is now proposed to curtail production of Bessemer Pig Iron and Billets, and a meeting of the Pig Iron and Steel interests is to be held in New York next week, probably Thursday, to take this matter up. The presidents of the Carnegie Steel Company, the National Steel Company, the American Steel & Wire Company, the American Steel Hoop Company and the Federal Steel Company have made a proposition to the independent furnaces to close down enough furnaces to take the surplus Iron out of the market. The Steel interests in consideration of this will shut off enough Steel capacity to take the surplus Steel out of the market. In this way another effort may be made to hold the market in check and in control of the above five interests. Unless the demand for Pig Iron improves very soon the Valley furnaces will have to do just this very thing—that is, shut down their furnaces, as it is a bad time to run and pile Iron at high prices. The Pig Iron situation is a good deal mixed just now, but it will probably clear itself within the next two or three weeks. In local Forge Iron there have been no actual sales below $16.50, but it is probable that $16 or less could be done on a firm order. Southern Forge has sold at $15.50, delivered, Pittsburgh, but this could also be materially shaded. There is a good deal of range in prices of No. 2 Foundry Iron, carload lots selling at $18.50 to $19, Pittsburgh. Round lots of 300 to 500 tons have been sold at about $16.25 to $16.35 at Valley furnace, deliveries running over two or three months.

Billets.—The price agreement on Bessemer and Open Hearth Billets has been thrown aside and the market is open. There has been no business done as yet, but on inquiries Bessemer Billets have been quoted at $20, maker's mill. There are very few buyers of Steel, as most of the large consumers, like American Steel & Wire and Republic Iron & Steel, are practically in a position to supply themselves with their own Steel. The market for Bessemer Steel may be quoted at $20, with the possibility that less could be done on large tonnage and extended delivery. We do not hear of any sales of Open Hearth Billets, but prices are probably about $22 at mill. There is no business offering.

Muck Bar.—Standard brands of all Pig Iron Muck Bar have been offered at $26, pittsburgh, but it is probable lower could be done on a firm offer. We do not hear of any sales.

Steel Bars.—As stated in this report for some weeks past, it only needed low prices to bring out orders for Bars. We are advised that several local mills have entered quite a good sized tonnage of Steel Bars in the past week at about 1.15c., or slightly less, at mill. On small lots 1.20c. to 1.25c. is quoted.

Plates.—There is a good deal of inquiry brought out by the low prices. Sheared Plates in round lots have sold at 1.15c., maker's mill.

(By Mail.)

On last Thursday, July 5, all prices agreements on Iron and Steel, except Structural Material, were cast aside, and a decided slump in prices of Iron and Steel has come and the market is declining very fast. It has been realized for some time that the policy of fixing prices on Pig Iron, Steel and Finished Material, and then selling a small tonnage under the fixed prices, was hurting the market instead of helping it. At a meeting of presidents and other officials of the leading Steel companies held in New York on Thursday and Friday of last week, it was decided, after going carefully over the situation, to throw all agreements aside and have an open market. It will be recalled that there have been fixed prices on Bessemer Iron, Billets and Steel Bars, but these have been largely nominal for some time. It is the desire of everybody to get the market down as fast as possible to a point where buyers will take hold and start business up. The National Steel Company, the Federal Steel Company and the Carnegie Steel Company are understood to have made desperate efforts to hold the market, but after carefully canvassing the situation in its different phases, decided to give way. The declaring of the market open means that these three concerns, who sell a very large tonnage in Billets and Finished Material, based on the price of Bessemer Iron, will have to accept very much lower prices, in some cases cuts of fully $10 a ton. The opinion is that when the market gets to that point where buyers will take hold we will have a good business sufficiently large to keep the mills fully employed. As prices are going down pretty fast, it is practically impossible to give quotations. It may be stated here, however, that Bessemer Pig Iron can be bought at $16 a ton, and Bessemer Billets at $20 to $21, but lower prices than these will no doubt rule before this month is much older. In Finished Material, Bars and Plates have shaded 1.25c. Sheets are weak and very little doing. The leading interest have as yet made no change in prices. There is a fair volume of business in Pipe at the lower prices, but Skelp and Scrap are very dull. The whole market, from Pig Iron right through Finished Material, is in a very chaotic condition just now, but it is probable before this month is out the situation will have cleared considerably.

Ferromanganese.—We quote domestic 80 per cent. at $85, in carload lots, and $100 in less than carloads.

Structural Material.—The largest local job in the market is the Union Depot, sheds, approaches and elevated tracks, which altogether will require probably 15,000 tons. However, only the Union Depot proper will be given out in the near future, and this calls for about 5000 tons. A new building for the Newaygo Portland Cement Company, at Newaygo, Mich., has been placed, and calls for 500 tons. It was taken by the American Bridge Company The same concern have taken some Structural work for National Steel Company. We quote: Beams and Channels up to 15-inch at 1.90c.; over 15-inch, 2c.; Angles, 3 to 6 inch, inclusive, 1.80c.; over 6-inch, 1.90c.; under 3-inch, 1.60c. to 1.70c.; Zees, 1.90c.; Tees, 1.95c.; Bars, 1.40c.; Universal and Sheared Plates, 1.25c. to 1.30c., all f.o.b. Pittsburgh.

Plates.—There is considerably more inquiry for Plates, but actual tonnage being placed is not as yet any larger. Buyers continue to place orders only for small lots, in anticipation that prices may go still lower than they are now. With Billets quoted at $20, it is simply impossible for a Plate mill that has to buy its Steel to live at present prices. We quote Tank Plate, ¼-inch and neavier, 1.25c. to 1.30c.; Shell, 1.30c. to 1.35c.; Flange, 1.40c. to 1.45c.; Fire Box, 2.25c. to 3c.

Bars.—The price agreement on Bars has been terminated and the market is open. While the nominal price of Bars under the agreement was 1.75c., there

have been none sold at this price for a long time. A small tonnage has been placed from the Agricultural Implement makers, but the bulk of this business is being held back, waiting until the market has touched bottom. The price of Steel Bars seems to have settled to about 1.25c., at mill, but in exceptional cases this has been shaded. We quote Iron Bars at 1.35c. to 1.40c., f.o.b. Pittsburgh. Prices on Hoops and Bands are lower, and we quote at 2.05c. to 2.15c., at mill. On a good order it is probable our lower price would be shaded. There is nothing doing in Cotton Ties.

Merchant Steel.—There is practically nothing doing, and all the local mills are closed, taking inventory, pending their transfer to the Crucible Steel Company of America. Subscriptions to the stock of this concern were opened to-day, and it is reported all the stock offered the public has been subscribed. Prices are merely nominal and we quote: Tire Steel, 1.75c. to 1.80c.; Toe Calk, 1.85c. to 1.90c.; Open Hearth Basic, 2.25c. to 2.35c.; Plow Slabs, 1.80c. to 1.90c.; Rolled Lay Steel, 2.75c.; Hammered Lay Steel, 3.10c. to 3.25c.; Tool Steel, ordinary grades, 7c., and upward, depending on quality. Terms are 60 days, 2 per cent. off for cash in 10 days, and on Tool Steel 25c. freight is allowed.

Sheets.—There is very little doing in the Sheet trade, buyers holding off waiting for lower prices. Orders are being placed only for small lots, and there are very few of these. The leading interest is reported to be holding No. 27 Black Sheets at about 3.15c.; No. 28 at 3.20c. However, these prices are being shaded by a few of the outside mills, and also by the jobbers, who have stocks and desire to unload. On a good order it is probable that on No. 28 3c. could be done. Demand for Galvanized Sheets is in small lots only, and we quote at 70 and 10 per cent., 15c. freight, but in exceptional cases an extra 2½ per cent. is allowed.

Tubular Goods.—The National Tube Company have closed contracts recently for some 50 to 60 miles of 8 and 10 inch Line Pipe. We are advised that there is a fairly satisfactory demand for Tubular Goods, but mostly for small lots, buyers being apprehensive of still lower prices. Some export business in Pipe is being figured on, and it looks as though a good deal of tonnage for the other side would come to this country. The mills quote consumers in carload lots as follows:

Merchant Pipe.

	Black. Per cent.	Galvd. Per cent.
⅛ to ½ inch and 9 to 12 inch	63	50
¾ to 8 inch	68	55

Casings.

	S. & S. Per cent.
2 to 2¾ inch	42
3 to 4½ and 7¾ to 12½ inch	56
4¾ to 7½ inch	60

Boiler Tubes.

Steel.	Up to 22 feet. Per cent.	22 feet and over. Per cent.
1 inch to 1½ and 2½ inch	50	45
1¾ to 2¼ inch	42	36
2¾ to 13 inch	55	50
Iron.		
1 inch to 1½ and 2½ inch	45	40
1¾ inch to 2¼ inch	40	34
2¾ inch to 13 inch	52½	47½

Skelp.—Two of the local Skelp mills have reduced wages of their men. There is very little doing in Skelp, and we are advised that some low quotations are being made. It is probable that on a good order Grooved Iron and Steel Skelp could be bought very close to 1.25c. On Sheared Skelp 1.30c. to 1.35c. is being quoted, but if there were any large tonnage offering it is probable these prices would be shaded.

Connellsville Coke.—Last week out of 20,341 ovens in the Connellsville region, 16,483 were active and 3858 idle, the output being 183,515 tons, a gain over the previous week of 10,361 tons. There is practically no demand for either Furnace or Foundry Coke. Standard Connellsville Furnace Coke has been offered at $2.50 a ton, but on contracts this would be shaded. Foundry Coke is quoted at $2.75 to $3 a ton at oven. With the rapidly falling Iron market, it is probable the price of Coke will be lower.

Iron and Steel Scrap.—The mills using Scrap are nearly all idle, and there is practically nothing doing. When a consumer comes into the market to buy, he can just about fix his own price. We quote No. 1 Railroad Wrought Scrap at $12 to $13, net ton; Borings, $6 to $6.50; Heavy Melting Stock, $13.50 to $14; Turnings, $8 to $8.50; Basic Melting Stock, $16 to $17; Old Iron Rails, $15 to $16; Cast Scrap, $12 to $13 net ton; Horseshoes, $14 net ton.

The American Bridge Company have opened offices in rooms 710 to 714, in the Empire Building, Pittsburgh, which are occupied by the contracting and structural departments. Wm. H. McCord, vice-president, is in charge of the structural department in New York, and his assistant is Albert L. Schultz, with headquarters in the Empire Building. The railway department is in charge of Chas. McDonald, vice-president, in New York, and his assistant is C. W. Bryan, with headquarters in the Empire Building. The highway department of the American Bridge Company is operated entirely in New York, and all vice-presidents are located in that city. At present the purchasing department of the American Bridge Company is located in the Metropolitan Bank Building, but will be removed soon to offices in the Empire Building. The plants owned and operated by the American Bridge Company in the Pittsburgh district are Keystone, Schultz, Pittsburgh, Shiffler and Youngstown.

Birmingham.

BIRMINGHAM, ALA., July 9, 1900.

The market has been entirely devoid of interest. Some No. 2 Foundry has sold at $15, and from that down to $14. The usual difference in price for the various grades has decreased, and it runs now from 50c. to 75c. It is claimed that while sales in the aggregate do not approach a large volume, yet there is a material increase over the weeks immediately preceding. But the purchases are confined to small lots. There has been no inquiry from any of the larger interests. They seem to be perfectly indifferent to the Iron market. There is one feature in the market that has an ugly look, and for which there should be prompt and adequate relief. When the market was on the up turn and the furnaces had sold freely they delivered their sales to purchasers. But the tables are turned now and the advantage of sales is with the furnaces. Buyers who were clamorous for their Iron when price was in their favor, now that it is against them, are using every pretext they can bring to the discrediting of their contracts. It is an evil that is of no mean proportions, and commercial honor should stand for the faithful keeping of contracts. As a result of this conduct stocks in furnace yards are piling up rapidly, though in reality the legitimate owner is not infrequently a defaulting buyer. It is getting to be a serious thing, and furnace owners will be forced to protect themselves by closer discrimination in credits.

The export trade is not very lively, but is not dead by any means. But for the scarcity of ocean tonnage offering this trade would pick up rapidly. As it is, all the available room offering is promptly absorbed. It will be an outlet more or less great for the Iron on which buyers have refused to accept delivery.

The miners and the operators came to agreement the past week and settled upon a wage scale which practically is what prevailed last year. This gives us a rest from the uncertainty of wages and is an incentive to complete some large enterprises that have been received with such favor.

The Semet-Solvay by-product plant at Ensley City will soon commence the erection of 120 ovens, thus doubling their capacity and calling for a large expenditure of money. Improvements under way and contemplated now will require months of constant employment before completion.

The outlook for continuous prosperity is fine.

The British Iron Market.

Business has been unimportant in view of the prevalent uncertainty as to the future course of prices and the few operations which have taken place have been of a hand to mouth character. In the finished branches the works remain busy; but here and there small reductions are made to secure business. There is no new development to report in the engineering trades, which are well employed, although new business is somewhat scarce; while the shipbuilding industry is in a similar position.

Pig Iron.—Business has been dull during the past week, buyers expecting prices to move in their favor and consequently confining their purchases to immediate requirements, although it is difficult to see how makers can grant any appreciable concessions on present rates while the cost of materials continues so high. At the same time a drop of 2 shillings 6 pence per ton in Lincolnshire brands is reported from Manchester, where the market has become disorganized as a result, and consumers are confirmed in their waiting policy. The fall is said to be owing partly to a cessation of buying for the Continent, and partly to the action of one of the Lincolnshire Pig Iron companies, who found themselves unable to dispose of their present production. Quotations are now about 70 shillings 6 pence to 71 shillings net, delivered Manchester, for No. 3 Foundry, and 71 shillings 6 pence, less 2½, de-

livered Warrington, for Forge qualities. In regard to Warrants, Scotch for the first time since the early part of February temporarily resumed their old position as compared with Cleveland, and were relatively dearer; but they have now fallen away again, present quotations being 67 shillings and 68 shillings 6 pence respectively. While nearly all other prices have been falling, Cleveland Hematite holds its own very well, there being little available, and in Barrow also prices of this description of Iron are firm.

Manufactured Iron and Steel.—The manufactured branches of the Iron and Steel trades show no appreciable diminution of activity, and prices on the whole are fairly well maintained, although, in a few instances, where makers have been in want of business, they have cut prices to secure it. As a rule, however, they are well booked ahead, and can afford to look with equanimity upon any little falling off there may be in the volume of new work now coming forward. There can be little doubt that in some cases buyers are holding their orders over to see if there is any likelihood of a reduction, but manufacturers as a whole are not inclined to take contracts except at full rates. The report concerning the intention of Glasgow Steel and Iron makers to shut down works owing to the price of Coal seems to have been a little exaggerated. It appears that the works are to be closed for the summer holidays for a longer period than usual.

Engineering and Shipbuilding.—The engineering trades continue to be well employed on work in hand, and there is no falling off in the demand for labor, except, perhaps, in some branches of the textile machine trades; but complaints are rife that new work is not coming forward so freely. Machine tool makers, boiler makers and locomotive builders and all sections of the electrical engineering trades are, however, in most cases supplied with sufficient orders to keep them fully going for some time ahead, and, taking the position all through, although the outlook perhaps scarcely promises a continuance of the exceptional briskness of the past 12 months, there are not as yet any indications of approaching actual slackness. In the shipbuilding industry there is little fresh to report, and only a few small orders have been placed.

Foreign.—In France there is little business doing. Makers are almost exclusively engaged upon the execution of old contracts, which are providing them with fairly regular employment, and new transactions are limited to the most pressing requirements. In Belgium there is very little buying at the present moment; but, except in one or two districts, where makers are obliged to restrict the running of their plant, most of the producers are regularly employed under old contracts. In Germany the situation continues good, but the considerable expansion which has recently taken place in productive capacity has already resulted in an easier tone.

Comparison of Prices.—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	June 28, 1900.	June 21, 1900.	June 29, 1899.
Iron Ore—	s. d.	s. d.	s. d.
Rubio, Middlesbrough	21 6	21 3	17 0
Rubio, Cardiff	20 6	20 6	15 6
Pottery Mine, North Staffordshire	20 6	20 6	14 6
Hematite, West Coast (at mines)	17 6	17 6	16 0
Pig Iron—			
No. 3 Foundry, Middlesbrough	69 0	68 9	68 0
Warrants	68 6	67 9	68 1½
Scotch Warrants, Glasgow	67 0	67 10	69 2½
Hematite Warrants, West Coast	80 5	80 10	78 0
Cold Blast (Foundry), South Staffordshire	130 0	130 0	110 0
Welsh Hematite, Cardiff	90 0	90 0	72 6
Manufactured Iron and Steel—	£ s. d.	£ s. d.	£ s. d.
Marked Bars, South Staffordshire	11 10 0	11 10 0	9 0 0
Common Bars	10 15 0	10 15 0	8 0 0
Steel Rails, Middlesbrough	7 12 6	7 12 6	5 7 6
Steel Rails, West Coast	7 7 6	7 7 6	5 7 6
Steel Rails, Cardiff	7 7 6	7 7 6	5 15 0
Steel Angles (eng.), Middlesbrough	8 15 0	8 15 0	7 2 6
Steel Angles (eng.), Glasgow	8 7 6	8 7 6	7 0 0
Steel Plates (ship), Middlesbrough	8 7 6	8 7 6	7 10 0
Steel Plates (ship), Glasgow	8 7 6	8 7 6	7 10 0
Tin Plates, Bessemer IC Cokes, South Wales	s. d.	s. d.	s. d.
	15 6	15 6	13 0

—The Iron and Coal Trades Review, London, June 29, 1900.

The Pennsylvania Malleable Company of Pittsburgh, operating a large plant at McKee's Rocks, Pa., are running night and day with a large force of men. This plant is a new one and is not yet entirely completed, but in about six weeks it is expected the work of construction will be finished, and when that occurs the force of men will be very largely increased. Richard G. G. Moldenke, who was recently elected secretary of the American Foundrymen's Association, is superintendent of this plant.

New York.

Office of *The Iron Age*, 232-238 William street, New York, July 11, 1900.

Pig Iron.—Some good sized inquiries made their appearance in the market in the past wek, but as far as known did not result in business. The continued dropping of prices evidently causes buyers to postpone their proposed purchases in the hope of getting still lower figures. The volume of business in small lots for quick shipment is also running quite light. Furnace companies are now of the opinion that prices are getting down to hard pan, believing that consumers who wait much longer, if they really need Iron, will not be able to secure such bargains as they would like. Quotations are as follows at tidewater: Lehigh and Schuylkill Irons, No. 1, $18 to $19; No. 2 X, $17 to $18; No. 2 Plain, $16 to $16.50; Gray Forge, $15 to $15.50. Southern brands, No. 1 Foundry, $19.75 to $20.25; No. 2 Foundry, $18.50 to $19; No. 1 Soft, $19.75 to $20.25; No. 2 Soft, $18.50 to $19; No. 3 Foundry, $17.25 to $17.75; Gray Forge, $16 to $17.

Steel Rails.—New business is confined to small lots. The manufacturers are receiving some inquiry for next year, but are not yet prepared to name prices. It is likely that rates for 1901 may be made about September 1. During the past week another lot of 5000 tons of Heavy Section Rails was offered for re-sale. These Rails can be secured at some concession from manufacturers' prices. Quotations are continued at $35 at mill in Eastern Pennsylvania for Standard Sections. Angle Bars are being quoted at 2c. to 2.20c.; Spikes, 2.15c. to 2.25c.; Square Track Bolts, 3.15c.; Hexagonal Track Bolts, 3.25c.

Cast Iron Pipe.—A local gas company will place a contract this week for 2000 tons. The Holyoke contract, calling for 750 tons, was taken by the Warren Foundry & Machine Company. The outlook in this trade is a little brighter. Inquiries are larger, and indications are appearing of considerably more business being placed soon. Prices, however, are weak, but for small lots of 8-inch Pipe at tidewater manufacturers quote $27 to $27.50.

Finished Iron and Steel.—Considerable business is pending in Structural Material. Quite a number of good sized contracts taking a large tonnage will shortly be placed. The Structural manufacturers held a meeting in the city to-day and decided not to reduce prices, believing that figures quoted are low enough. The demand for other classes of Finished Iron and Steel is only moderate, and competition for business among the different manufacturers is quite keen. We quote as follows at tidewater: Beams, Channels and Zees, 2.05c. to 2.15c.; Angles, 1.95c. to 2.05c.; Tees, 2.10c. to 2.20c.; Bulb Angles and Deck Beams, 2.35c. to 2.45c.; Universal Mill Plates, 1.45c. to 1.55c. Sheared Steel Plates are 1.45c. to 1.55c. for Tank, 1.55c. to 1.65c. for Shell, 1.65c. to 1.80c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1; 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.50c. to 1.60c.; Common Bars, 1.40c to 1.50c.; Soft Steel Bars, 1.50c. to 1.60c., and Hoops, 2.25c. to 2.35c., base, on dock.

Old Material.—The market for Old Material is absolutely stagnant. Manufacturers are not disposed to make any purchases at present, and dealers likewise are not inclined to speculate. Railroad companies are receiving such low bids on the Old Material they are offering that they are refusing to make sales.

C. F. Davenport, 10 Havemeyer Building, New York, is the Eastern manager of a series of Eastern offices of the Atlantic Tube Company, Pittsburgh, Pa., the company having branches in Boston, Philadelphia and Baltimore in addition to the New York headquarters. They have a new process for making seamless cold drawn Steel Tubing for locomotive, marine and stationary boilers, automobile, bicycle, engineering and mechanical purposes.

The Advisory Board of the Amalgamated Association of Iron, Steel and Tin Workers met on Tuesday in Pittsburgh to consider matters relating to the bar iron and tin plate scales which remain unsettled. It is possible that the result of the vote of the various lodges on the proposition to give the Scale Committee full power to act on the tin plate and bar iron scales will be known by the officials within a day or two. It is certain that the committee will be given such power, and in view of this and also of the fact that the sheet mill scale has been arranged, it is likely that the bar iron and tin plate scales will be settled very soon. Conferences on both are likely to be held next week.

Metal Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, July 11, 1900.

Pig Tin.—Since our last writing this metal has advanced considerably, both in this country and abroad. The movement comes from the same source from which similar manipulations have emanated of late. The corner has proved much more effective than was expected in most quarters of the metal trade. Spot Tin to-day closed 32½c. to 32¾c. There was not much buying, however, in this market. The London market closed to-day £141 10s. for spot and £137 for three months' futures. The semiannual statistics of Tin, as compiled by the New York Metal Exchange, are as follows:

(In tons of 2240 pounds.)

SHIPMENTS.

	1900.	1899.	1898.
Total Straits to Europe and the United States for the six months ending June 30	21,830	22,250	22,440

DELIVERIES.

For the six months ending June 30.	1900.	1899.	1898.
United States (exclusive Pacific ports)	14,800	15,700	13,900
London	7,830	6,400	8,420
Holland	6,666	7,669	7,792
	29,296	29,769	30,112

VISIBLE SUPPLY.

	1900.	1899.	1898.
Total on June 30	15,192	18,768	23,515
United States (exclusive of Pacific ports) on June 30	4,220	5,188	5,949

QUOTATIONS ON JUNE 30.

	1900.	1899.	1898.
New York	31.75	26.82½	15.45
London	£145	£120 15s.	£70 15s.
Singapore, C. I. F., London	£34	£121	£71 10s.
Silver in London	28¼d.	27 11-16d	27⅛d.

Copper.—There is no change in the condition of this market. Buying is by no means brisk, and in almost all cases the same quotations are given as those which we published last week. These are 16¼c. to 16½c. for Lake Superior Ingot and 16c. to 16¼c. for Electrolytic and Casting stock. In certain quarters it is stated that Lake can be had for 16⅛c., and it is even suggested that it might be obtained at 16c. The situation still depends largely on the course to be pursued by the Calumet & Hecla Company. Thus far there have been no indications as to whether or not the company will make one of their periodical sales in the near future. There has been a great flurry in London, and during the last two days the price has advanced over £1, the closing cables to-day naming £72 10s. for spot and future. Best Selected has not changed, however, and is still quoted £76. It is remarked in the trade that it is very strange that so shortly after the falling off of exports has been made known, ridiculous reports should be sent out and the London speculative market moved up so radically. It is suggested that the object of this may be to spur on a little anxious inquiry here. The exports for the first ten days of this month amounted to but 2600 tons, showing a heavy falling off.

Pig Lead.—Another ⅛c. reduction of price was announced last Monday by the American Smelting & Refining Company. This brings the price back to 4c. flat. Consumers are more mystified than ever, and it is almost needless to state are buying very little of the metal. The London price is £17 10s. for Soft Spanish.

Spelter.—There has been a slight reaction, and the market again shows signs of weakness. Business is of small volume. Spot and futures are offered here at 4.25c., with no one bidding higher than 4.20c. London cables announce £19 10s. at the close to-day. This is a reduction of 15 shillings from last week.

Antimony.—There has been no change, Hallett's still being quoted at 9⅝c., and Cookson's 10½c. to 11c.

Nickel—Continues strong, but without change in price. It is still impossible to obtain large lots, and small lots command 55c. to 60c.

Quicksilver.—Wholesale lots of 100 flasks and more are quoted at $51 per flask of 76½ lbs. London is unchanged at £9 10s.

Tin Plate.—Owing to the closing of the mills of the American Tin Plate Company consumers covered themselves pretty well for this month. Consequently the buying movement at present is very slight. This absence of orders is also to be accounted for by the fact that the company cannot promise delivery before September. For this reason buyers are disposed to wait with their September purchases. Prices are unchanged. The American Tin Plate Company quote on a basis of $4.84 per box of Standard 100-lb. Cokes, New York delivery, or $4.65 f.o.b. mill.

The Cleveland Molders' Strike.

The strike instituted in Cleveland and Lorain last week by the machinery molders promises to be a long one. When the recent temporary agreement, which was terminated in Detroit, came to a close the molders in the fourth district, with the exception of those in Cleveland and Lorain, remained at work and are still working. The fourth district embraces all of Ohio and a number of cities in adjoining States, including Detroit; hence it is evident the molders' union expects to concentrate its strength in the two cities. The organization is a powerful one and has a well filled treasury, and as long as the strike lasts it is stated that the men will be paid.

The Cleveland Foundrymen's Association have decided to leave the matter of settlement entirely with the National Founders' Association, and a conference of the officials of this association will be held in a few days to decide on a plan of action. It is thought that extreme measures will be hardly necessary from the fact that many of the Cleveland foundries are well stocked with standard castings, which accumulated during the long strike of the machinists. There is said to be considerable hard feeling between the machinists and the molders because the latter would not go out during the former strike, hence it is believed that the machinists would not assist the molders in their present fight by refusing to handle castings furnished by other foundries in the National Founders' Association. Neither would the machinists refuse to handle the work of imported men.

It is quite possible, however, that in the event of the prospect of a protracted fight the Founders' Association may decide to order a lockout throughout the entire fourth district and possibly throughout the country. It is stated that the present time is opportune for such a move because of a falling off in orders and the general tendency to hold off business until prices of material reach a stable basis.

A New Lead and Zinc District.

It is somewhat surprising that a district in this country, now reported to be rich in its resources of lead and zinc, should not have been known until within a very few months. The district is in a remarkably central location and easy of access to the great markets of the country. In Livingston and Crittenden counties, Kentucky, large deposits have been found and are now being developed. Fluorspar, lead and zinc are taken from the same mine. The veins are stated to be from 4 to 40 feet in width, and from 2 to 5 miles apart. The pay dirt runs 20 to 42 per cent. zinc, 18 to 25 per cent. lead, and 30 to 60 per cent. fluorspar, thus making only about 10 per cent. waste. Notwithstanding the short time since this district has been developed, some 20 mines have been opened and are now being worked. The center of the district is Salem, Livingston county. The Cumberland River is on the south and the Ohio River on the west, while the Illinois Central Railroad runs through the district. These rivers are open for navigation the entire year. It is naturally expected that this district will, within reasonable time, have some effect on the zinc and lead market.

Information Wanted.—Who manufactures carpet cleaning machinery ?

A wreck on Lake Erie, during a severe storm last Saturday, wiped out nearly the entire families of John and James Corrigan, well-known in Cleveland iron and shipping circles and members of the firm of Corrigan & McKinney. The party were on board of the "Idler," a schooner yacht owned by Captain John Corrigan. The lost were Mrs. James Corrigan, her daughter, Mrs. Nettie Riley, and infant child; Miss Jane Corrigan, Miss Ida May Corrigan, and Miss Etta Corrigan, the latter a daughter of John Corrigan. Mrs. John Corrigan was the only one of the passengers who escaped. The wreck occured a few miles off Cleveland.

It is probable that directors and officials of the Crucible Steel Company of America will be elected at the meeting to be held in Pittsburgh on Thursday of this week. Immediately after this is done a New Jersey charter will be taken out. At the Union Trust Company in Pittsburgh on Tuesday books were opened to receive subscriptions to the stock of this new company to the amount of $10,000,000, half of which is preferred and half common. At the rate subscriptions are coming in, the entire issue offered to the public will be over subscribed. The stock of this company is regarded very favorably by investors and the public. The new company will control fully 95 per cent. of the crucible steel business of the country.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JULY 11, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
$29,000,000	Am. Car & Foundry, Common...	1,207	-16¼	15¾-16½	.....	15⅝-16	-15½	.....
29,000,000	Am. Car & F'y, Pref. (7 % Non-Cu.).	2,799	63⅜-64⅞	64¼-64⅜	64¼-64¾	64½-65	-63	63¼-64½
19,000,000	Am. Steel Hoop, Common.....	4,650	19½-20¾	20 -21¼	20 -20⅛	19½-20½	20 -20¼	19⅞-20¼
14,000,000	Am. Steel Hoop, Pref. (7 % Cu.)...	2,210	.....	67 -68¾	-68	-67¾	-68	67¾-68
50,000,000	Am. S. & W., Common.....	32,855	31½-38⅞	32⅝-34⅜	31⅞-33½	32¼-33⅞	32½-33⅞	32½-33½
40,000,000	Am. S. & W., Pref. (7 % Cu.).....	8,390	72¼-73¼	72¼-73⅞	72½-72¾	-72	72¼-73¼	72⅞-73
28,000,000	Am. Tin Plate, Common, N. Y....	10,405	19 -20	20¼-21½	.....	-20½	21½-21⅞	21 -21½
18,325,000	Am. Tin Plate, Pref., N. Y. (7 % Cu.)	1,020	.....	74 -75	.....	74¼-75	....	-74⅞
7,500,000	Bethlehem Iron†.....	23	.....	....	....	.....	-57	.....
15,000,000	Beth. Steel, Par $50, $1 paid in....	1,442	-15	15⅛-15½	.....	. ...	15½-16	-15½
7,974,550	Cambria Iron, Phila*.....	127	42¾-43	-43	.....	-43	43 -43¼	.....
16,000,000	Cambria Steel**.....	8,255	15¾-16⅛	15⅞-16⅜	16 -16⅛	-16⅛	16¼-16½	16¼-16⅜
11,000,000	Col. Fuel and Iron.....	6,050	32⅛-33⅝	32½-33½	32 -32½	-31½	32½-33¼	32¾-33⅜
46,484,300	Federal Steel, Common..... ..	22,530	31½-34	33 -34¼	32¾-33½	32½-33½	32⅝-33¾	32⅞-33⅞
53,253,500	Federal Steel, Pref. (6 % Non-Cu.).	4,510	65 -66⅞	-67	-65½	65½-66	66 -67¼	66¼-67
32,000,000	National Steel, Common, N. Y....	7,080	23¼-25¼	24¼-25	24 -24½	23½-24½	23 -24¾	23¼-25
27,000,000	Nat'l Steel, Pref., N. Y. (7 % Cu.)	1,340	-85	84½-85¼	83⅛-83½	-83⅞	84 -84½	.....
40,000,000	National Stl. Tube, Common, N.Y.	5,307	44½-45	-45	-46	46 -46½	46 -46¼	-46½
40,000,000	National Stl. Tube, Pref., N. Y...	2,748	-88½	-88½	.....	-89	89¼-90⅛	90¼-90½
5,000,000	Penna., Common, Phila.....	.....	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	2,100	45½-45¾	-45½	-45¼	45¼-45⅝	44 -45⅜	44 -44⅜
12,500,000	Pressed Steel, Pref. (7 % Non-Cu.).	710	74½-75	-76	....	-74	.....	-75
27,352,000	Republic Iron & Steel, Common..	3,785	10⅛-11⅜	11 -11¼	11 -11¼	-11⅛	11⅜-12½	11½-11¾
20,852,000	Repub. Iron & Steel, Pref. (7 % Cu.).	3,759	53½-54½	-55	55 -58¼	55 -56	55 -55½	56 -57
7,500,000	Sloss-Sheffield S. & I., Common..	100	.....	.....	.....	-19⅞	.....	....
6,700,000	Sloss-Sheffield S. & I., Pref.....	737	63½-64	.....	.....	-64	.....	-63
20,000,000	Tennessee Coal and Iron.....	12,535	67 -69½	68 -69¾	-68½	66½-68½	67 -69½	68¾-69½
1,500,000	Warwick Iron & Steel (par $10)...	720	.....	- 7¾	- 7¾	- 7¾	.....	- 7¾

* Par $50. ** $9 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded indebtedness: Am. S. & W., $130,656; Am. Tin.Plate, none; Am. Steel Hoop, none; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., $9,822,000 Illinois 5 %, $7,417,000 E. J. E. R. R. 5 %, $1,600,000 Johnson 6 %, $6,732,000 D. & I. R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $10,000 land grant D. & I. R. R. R. 5 %; National Steel, $2,561,000 6 %; National Tube, none; Tennessee C., I. & R. R. Co., $8,367,000 6 %, $1,114,000 7 %, $1,000,000 7 % cu. pref.; Pennsylvania Steel, $1,000,000 5 %, Steelton, 1st, 1917. $2,000,000 5 %; Sparrow's Point, 1st, 1922, $4,000,000, consolidated, both plants; Bethlehem Iron, $1,351,000 5 % maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6 % $880,000, Col. Coal & Iron Con. Mort. 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,308,000. Also outstanding $2,000,000 preferred stock with accumulated dividends of $640,000 to June 30, 1899.

Iron and Industrial Stocks.

During the past week the iron and steel stocks have been unusually dull as far as the volume of business is concerned. Prices have changed but slightly, and in no single instance have the fluctuations been of any importance. A change of one or two points has marked the extreme in the majority of the transactions.

	Bid.	Asked.
American Bicycle Company, Common.....	6½	7
American Bicycle Company, Preferred.....	30	36
American Bicycle Company, Bonds.....	..	66
E. W. Bliss, Common.....	..	137½
E. W. Bliss, Preferred.....	125	..
Cramp's Shipyard Stock.....	75	80
Diamond State Steel.....	3½	3⅝
International Pump, Common.....	18¼	19½
International Pump, Preferred.....	65½	67
Otis Elevator, Common.....	29½	30
Otis Elevator, Preferred.....	87	88
Pratt & Whitney, Common.....	3½	5
Pratt & Whitney, Preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	9	9⅛
U. S. Cast Iron Pipe Company, Common.....	4½	5
U. S. Cast Iron Pipe Company, Preferred.....	38½	39½
H. R. Worthington, Preferred.....	..	110
Empire Steel, Common.....	..	10
Empire Steel, Preferred.....	30	36

The Allegheny Heating Company, Allegheny, Pa., have declared the regular quarterly dividend of 3 per cent., and an extra dividend of 2 per cent., payable July 25.

The Pittsburgh Coal Company of Pittsburgh have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable July 25.

The Standard Underground Cable Company of Pittsburgh declared a quarterly dividend of 2 per cent., payable July 10.

The net profits of the American Steel & Wire Company for the first five months of 1900 are said to more than equal the dividends on the preferred and common stock for the whole year. It is reported that out of the earnings for this year will be declared the common stock dividend of 1901.

The formal acknowledgment of a mortgage for $54,000,000 was made in the office of James B. Dill, at East Orange, N. J., last week by the Carnegie Company of Pittsburgh to secure an issue of bonds. The president of the Carnegie Company, C. M. Schwab, and A. M. Moreland, the secretary, were present when the papers were executed.

The directors of the Standard Plate Glass Company of Pittsburgh have declared a dividend of 3 per cent. The company resumed dividend payments last winter after an interruption of eight or nine years, paying 3 per cent. in February. The present dividend is the second this year, but it is not styled either semiannual or quarterly. The company have in the last two years retired all their second mortgage bonds, and all but a small part of the first mortgage bonds. It was desired to redeem the entire funded debt, but although a premium was offered for the first mortgage 6s the holders of some of them could not be induced to part with them. They expire in 1902. The company are reported to be now practically free of debt and are said on good authority to be earning at the rate of 25 per cent. on their capital stock. The Pittsburgh Plate Glass Company have this year also wiped out their bonded debt and increased their dividend rate from 4 to 6 per cent. a year, and a further increase is considered practically certain.

The Philadelphia Company of Pittsburgh have declared a quarterly dividend of 1¼ per cent. on the common stock, payable July 20.

The directors of the International Steam Pump Company will meet on Thursday. The regular quarterly dividend of 1½ per cent. on the preferred stock will be declared.

The Electric Company of America, at Philadelphia, have declared a dividend of 50 cents per share, payable July 30.

The directors of the National Carbon Company, Chicago, will meet about July 19, to take action on the preferred stock dividend.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street, NEW YORK, July 11, 1900.

The consensus of reports received in the machinery district during the last week indicates that a good volume of business was transacted. This is especially true when the general condition of affairs is considered. The summer season is now fully upon us, and, according to tradition, a season of dullness should be looked for. Besides this, a feature that should be considered is that consumers are not buying more than their absolute requirements dictate. Consequently the merchants' reports of good business bespeak a healthy condition underlying the present position of the market. It is now becoming very plain that the reaction from the boom of last year is much less abrupt than was generally anticipated. Members of the trade unite in the belief that the fall trade will remove that feeling of cautiousness which dominates purchasers at present. As soon as this distrust on the part of the consumer is removed it is believed that a brisk buying movement will set in, and there will be a general clearing up of the numerous deals which have hung fire for some time.

A meeting of the directors of the Pratt & Whitney Company is in session at Hartford at the time of this writing. The meeting has been called for the purpose of acting on the consolidation plan with the Niles-Bement-Pond Company. It is expected that the proposition will be ratified as all obstacles which have previously obstructed the channels toward consummation

have been removed. It is said that the contract will be presented and probably signed by all of the parties interested, as they are also to be present at the meeting. After the formal signing of the papers a statement will be prepared setting forth all of the details of the transaction. This will be sent to the individual stockholders of both the Pratt & Whitney Company and the Niles-Bement-Pond Company.

We understand that nothing has been done as yet toward purchasing the equipment for the new shops, which are to be built at Reading, Pa., by the Philadelphia & Reading Railroad. The specifications are not completed.

There are indications of activity in shipbuilding quarters and considerable good business will doubtless accrue in the near future as a result of the activity displayed in this industry. It is said on good authority that plans are being formulated for very extensive additions to be built to the plant of the William R. Trigg Company of Richmond, Va. It is stated that this company will equip a shop of sufficient size and capacity to build large naval vessels, and it is expected that the company will figure among the competitors for the list of new ships for which the Government will soon advertise. The buildings are now being erected for the new plant of the Eastern Shipbuilding Company. This plant is to be located at New London, Conn. The enterprise is being backed by James J. Hill, president of the Great Northern Railway. Mr. Hill has given orders to the new shipbuilding company for two vessels which are to be of the greatest tonnage of any ships ever built. They are to ply between our Pacific Coast cities and the Orient. They will each be 650 feet in length by 73 feet beam, and will contain seven decks. The two vessels will cost $5,000,000. Among the experienced shipbuilders who are connected with the company are Charles R. Hascom and William A. Fairburn, formerly superintendent and naval architect respectively of the Bath Iron Works of Bath, Maine. The Eastern Shipbuilding Company are now purchasing the equipment for their new plant.

The additions which have been in course of construction for some time at the works of the Wm. Cramp & Sons Ship & Engine Building Company are not as yet completed and the company are continually placing orders for machine tools.

S. J. Allen of the Franklin Air Compressor Company is in this city purchasing machine tools for the equipment of the new shops which the company are building at Franklin, Pa. He is making his headquarters at the offices of the Chicago Pneumatic Tool Company, 95 Liberty street.

Specifications have just been issued by John R. Thomas of 160 Broadway for the electric equipment, steam power, heating and ventilating apparatus, plumbing and draining systems, elevator equipment, ornamental metal work, hardware and other work in connection with the erection of the Hall of Records Building, which is being built on Chambers, Centre and Reade streets, this city. The specifications call for five steam boilers of the water tube type, having a total of 10,810 square feet of heating surface and 234 square feet of grate surface. A system of tracks, turntables and charging cars is to be placed in the basement of the building for handling coal and ashes. A vertical feed water heater to contain 266 2-3 square feet of heating surface is called for, as well as blow off tank, drip tanks, feed water filter, muffler tank, steam separator and all fittings. Three 7½ x 4½ x 6 inch and seven 6 x 4 x 6 inch duplex steam pumps are also specified. In the ventilating apparatus there will be four blowers and four tempering coils in the cellar for the supply of warm air through the entire building, and four exhaust fans in the attic for removing the foul air from the building. There will be two blowers for supplying cold air and two exhaust fans for the ventilation of the engine, boiler and pump rooms. Four of the fans are to have blast wheels 9 feet in diameter and 4 feet wide, each direct connected to an electric motor. Two fans are to have blast wheels 8 feet in diameter by 3½ feet wide, and 7 feet in diameter by 3½ feet wide, respectively. They are to be coupled together on one shaft and driven by direct connected motor. Two of the fans are to have blast wheels 5½ feet diameter by 3 feet wide and 5 feet diameter by 32 inches wide, respectively, and coupled on a single shaft, direct connected to an electric motor. Each of the tempering coils is to have 2000 square feet of heating surface. There will also be required four 72-inch exhaust fans, each direct connected to motor and erected in attic. There will be four 20 horse-power, one 40 horse-power, and one 25 horse-power motors required in connection with this branch of the work. This work also requires a system of galvanized iron air supply and exhaust ducts, flues, &c.

The heating will be done by steam radiation, automatically controlled by thermostats. A system of pneumatic valves will also be installed requiring the installation of two air compressors. The specifications provide for three slow speed non-condensing steam engines of the Corliss type. Two are to be of 240 indicated horse-power and one of 160 indicated horse-power. They are to be direct connected to the dynamos, two of which are to be of 150 kw. and one of 100 kw. There is also to be provided one direct connected automatic cut off high speed engine of 80 horse-power. There will be six passenger elevators, four private elevators and one platform elevator. The pumping plant for operating these will consist of three compound duplex pumps and one steam pump. Two duplex steam pumps will be required in connection with the sewage service and a 12 x 7 x 10 inch fire pump is also called for. A complete apparatus for sterilizing, cooling and circulating drinking water is specified. Bids are called for July 19.

McClave, Hamilton & Rimmer of 85 Liberty street have received an order from the Lackawanna Valley Light, Heat & Power Company of Carbondale, Pa., for three 300 horse-power Ridgeway engines. They are to be direct connected to Ridgeway dynamos.

The Chicago Pneumatic Tool Company have received an order from Cienfugos, Cuba, for a complete equipment of pneumatic tools and an air compressor for operating a boiler plant. The contract for the compressor was sublet to the New York Air Compressor Company. George Zollers, one of the company's engineers, will accompany the material and superintend the equipment of the plant.

A new set of proposal blanks have been issued for the machinery necessary for the equipment of the sewage pumping plant to be installed at Houston, Texas. The bids will be opened on Monday, July 23. Alexander Potter, 150 Nassau street, New York, is consulting engineer to the municipality. The machinery to be furnished consists of one 6,000,000 gallon centrifugal pump, one 3,000,000 gallon centrifugal pump, one 130 horse-power high speed engine, one 75 horse-power high speed engine, two 100 horse-power water tube boilers, one self supporting steel stack, one 10-inch direct connected centrifugal steam pump, piping, condensers, &c.; one 100 kw. electric motor and one 56 kw. electric motor.

The Oil City Boiler Works of 39 Cortlandt street and Oil City, Pa., have been awarded the contract for the 1000 horse-power boiler plant to be built in connection with the new plant of the North Hampton Portland Cement Company, which is being erected at Stockertown, Pa.

Bids on Government Contracts.

WASHINGTON, D. C., July 10, 1900.—The Navy Department has opened bids for machine tools, &c., for the Portsmouth, Boston and Washington navy yards. The bidders and their proposals are as follows:

Portsmouth.

Bidder 1, Mitts & Merrill; 2, Gleason Tool Company; 3, Bement, Miles & Co.; 4, Manning, Maxwell & Moore; 5, New York Air Compressor Company; 6, U. Baird Machinery Company; 7, Ingersoll-Sergeant Drill Company; 8, Wm. Sellers & Co., Incorporated; 9, W. H. Foster; 10, Cumberland, Dugan & Co.; 11, Niles Tool Works Company; 12, Morgan Engineering Company.

Class 1, one 800-pound single stand steam hammer, complete: Bidder 3, $845; 4, $864; 10, $875; 12, $945. Class 2, one key seating machine, complete: Bidder 4, $420; 1, $475; 9, $710. Class 3, one 60-pound helve hammer: Bidder 11, $349; 6, $475; 4, $568. Class 4, one automatic gear planer: Bidder 2, $1569. Class 5, one air compressor: Bidder 7, $4995; 4, $5190; 5, $5412. Class 6, one portable slotting machine: Bidder 8, $1405. Class 7, one automatic screw machine: Bidder 11, $365. Class 8, one automatic screw machine: Bidder 11, $944. Class 9, one 6000-pound double stand steam hammer: Bidder 3, $4174; 6, $4174; 4, $4275; 12, $4915. Class 10, one automatic screw machine: Bidder 11, $1049.

Washington.

Bidder 1, Merchant & Co.; 2, James Clendenin; 3, Nassau Smelting & Refining Works.

Class 1, 20,000 pounds pure Lake Superior copper, ingot: Bidder 3, $32,872; 2, $33,852. Class 2, 60,000 pounds zinc, slab: Bidder 2, $2637; 3, $3300; 1, $4475.

Boston.

Bidder 1, Wm. H. Wood; 2, Bement, Miles & Co.; 3, Manning, Maxwell & Moore; 4, The Morgan Engineering Company.

Class 7, one hydraulic keel plate bending machine, complete: Bidder 1, $6975; 2, $8975; 3, $11,990; 4, $17,800. Class 8, one hydraulic manhole punching machine, complete: Bidder 1, $1835; 2, $3695; 4, $4500; 3, $4973. Class 9, one universal hydraulic flanging machine, complete: Bidder 4, $3300; 2, $3800; 3, $4495; 1, $4975. Class 10, one hydraulic accumulator: Bidder 2, $3800; 1, $5377.

W. L. C.

HARDWARE.

Condition of Trade.

AN exceptionally complete and thoroughly reliable view of the market is given in the pages which follow, containing extracts from letters from representative manufacturers in many departments of the Hardware trade. The different features of the situation are touched upon by our correspondents, and while there is a good deal of diversity in the views expressed, those who carefully study this interesting presentation will have a good deal of light on the business situation, and will be put in possession of facts regarding the special lines referred to. It will be observed that while the outlook by most of them is regarded as promising, many of them are suffering at the present time from the lack of confidence in the market, and the extent to which they are being undersold by the jobbers who are anxious to dispose of their stocks, some of which were purchased at low prices.

The market has not developed a great many changes during the past week, and on the whole there is, perhaps, a somewhat steadier tone in it. Manufacturers of many goods which advanced freely last year are holding at old prices, thinking this better policy than to announce new prices, which would perhaps be only temporary. Notwithstanding the disposition of the trade to buy very lightly, some business is doing, and the character of orders received by some manufacturers indicates that jobbers' stocks are beginning to run low.

Foreign trade continues to attract much attention and manufacturers are cultivating it more assiduously and intelligently than ever before. The growing volume of exports is evidence of their success, but the indications point to a great extension of business in this direction, and the constant opening up of foreign markets to American products, in which those in the Iron, Machinery and Hardware lines will have a prominent place.

Chicago.

(By Telegraph.)

There are few new features in the Hardware trade at Chicago upon which to make a comment. The character of the mid-summer lull partakes less of the deadening qualities than usual, as a certain amount of activity survives, and a vigorous and healthy consumption for seasonable goods is anticipated. As compared with last week the growth of trade is quite apparent, but the holiday character of the first week in the month explains that difference. Some, but not all, salesmen have returned to their accustomed routes with discernible results. Merchants who order fall goods in advance completed their purchases some time ago. Those who wait till the goods are required will not buy for some weeks. Consequently the present buying corresponds closely to current needs. Sellers of Building Hardware note an improvement in the demand from Chicago slight but encouraging. Buildings that have been unostentatiously going up during these past weeks of supposed idleness are now ready for the Hardware. New projects about to be commenced are likewise affording a market. Chief interest is directed to the extent of the crop shortages throughout the West, and the degree to which the Hardware trade will in conseqence be affected. Present buying affords feeble clue, because of its scantness. But differences in the demand can be perceived between those districts seriously affected and those where bountiful crops are assured. Among the latter trade is uncommonly well preserved. Heavy Hardware trade is large and altogether satisfactory from the sellers' standpoint.

St. Louis.

The first two weeks of July this year are being given over to annual vacations more universally than was the case last year. Salesmen are posting up for the next trip among their trade. Neither jobbers nor dealers seem to be selling large quantities of any one line. The frugal dealer is buying for immediate needs, and is also wisely seeing that his assortment is not allowed to fall to pieces. Some jobbers say they would welcome as a regular thing that purchases be made for reasonably ready wants instead of the buying for distant use which has been the practice of late. They say the latter plan does not cause an increased consumption of goods, but unnaturally expands manufacturers' and jobbers' sales for a given period. From travelers' reports it is seen that some are very sanguine as to the fall trade, and expect it to be uncommonly large. Even the most conservative representatives believe that, should the trade cover consumptive needs only, the volume of transactions will compare very favorably with those of last year. Harvest reports from the Southwest and West bear evidence of heavy yields. Hard rains in some Southern States and parts of Texas have checked business somewhat, but August and September sales will probably bring the quarter up to a fair average. The Heavy Hardware trade is in very good shape for this period. Orders of fair size are had by jobbers, and the large consumers are said to be placing orders now to cover wants some weeks ahead.

Notes on Prices.

Wire Nails.—There is comparatively light demand for Wire Nails, orders usually being for less than carload lots. The American Steel & Wire Company announce that in future jobbers buying car lots of Fence Wire and Nails f.o.b. Pittsburgh or Cleveland, can make their own freight arrangements if they so desire, as the company will not insist upon delivering carload lots based on Pittsburgh all rail freight added to their jobbing carload prices. The company believe that this change will be acceptable to most buyers, and particularly to those shipping to points reached by water. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off in 10 days:

To jobbers in carload lots	$2.20
To jobbers in less than carload lots	2.25
To retailers in carload lots	2.30
To retailers in less than carload lots	2.40

New York.—A limited quantity of Wire Nails are changing hands in this market. For small lots from store $2.60 has become the general price. Quotations are as follows:

To retailers, carloads on dock	$2.48
To retailers, less than carloads on dock	2.61
Small lots from store	2.60

Chicago, by Telegraph.—The Wire Nail trade is generally allowed to take care of itself. This it does quietly, but with quite good results. The business perhaps cannot be called active, but neither can it be described as dull. Buyers are taking only what they need for quick consumption. Quotations from store are unchanged at $2.43 for carloads and $2.50 for small lots.

St. Louis.—Quite a regular demand is reported for Wire Nails, and aggregate sales are said to keep up exceedingly well. The quotation covering single carloads

is $2.53, base; smaller quantities out of stock, $2.63, base, St. Louis.

Pittsburgh.—Up to within a week or two ago there has been a fair demand for Wire Nails. Orders at the present time, however, are mostly for small lots, jobbers and small dealers not desiring to carry stocks. We quote as follows: To jobbers in carload lots, $2.20; to jobbers in less than carload lots, $2.25; to retailers in carload lots, $2.30; to retailers in less than carload lots, $2.40. Contracts at above prices can be made for shipment in 60 days from date of contract, the terms being 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

Cut Nails.—The revised prices of Cut Nails, as announced last week, have not increased demand to any noticeable extent. Ordering small lots to keep up assortments is the policy generally pursued by buyers. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots	$1.95
To jobbers in less than carload lots	2.00
To retailers in less than carload lots	2.10

New York.—A seasonable demand for Cut Nails at this point defines the condition of the market. The irregularity in prices referred to last week has resulted in $2.25, for small lots from store, being generally made to the retail trade. Quotations are as follows:

To jobbers in carload lots on dock	$2.13
To jobbers in less than carload lots on dock	2.18
To retailers in less than carload lots on dock	2.31
Small lots from store	$2.25 to 2.35

Chicago, by Telegraph.—The volume of trade in Cut Nails shows little variation. Prices are steady, store quotation in small lots being $2.25.

St. Louis.—Light sales recorded at price ranging from $2.40 to $2.50, base, St. Louis.

Pittsburgh.—There is a moderate demand for Cut Nails, in certain sections being much larger than for Wire Nails. Some fair sized orders are being placed. We quote Cut Nails at $1.95 to jobbers in carload lots, $2 to jobbers in less than carload lots, and $2.10 to retailers in less than carload lots, all f.o.b. Pittsburgh, terms 60 days or 2 per cent. off for cash in 10 days.

Barb Wire.—Barb Wire is not expected to be in active demand during July and August. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted	$2.50
To jobbers in carload lots, Galvanized	2.80
To jobbers in less than carload lots, Painted	2.55
To jobbers in less than carload lots, Galvanized	2.85
To retailers in carload lots, Painted	2.60
To retailers in carload lots, Galvanized	2.90
To retailers in less than carload lots, Painted	2.70
To retailers in less than carload lots, Galvanized	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

Chicago, by Telegraph.—Jobbers who aim to keep complete stocks and not to overbuy find that assortments are broken with greater frequency than they had anticipated, denoting a somewhat heavier buying than expected. However, little trade is perhaps anticipated at this season of the year. Quotations for small lots, Chicago delivery, are $2.40 for Plain Annealed, $2.75 for Painted Barb and $3.10 for Galvanized Barb Wire.

St. Louis.—The great activity in the harvest field still keeps the farmers' attention away from property improvements and repairs. However, the demand for Barb Wire is not of a discouraging nature. Quotations are, for single carloads: Painted, $2.83; Galvanized, $3.13; smaller lots from jobbers at an advance of 10 cents.

Pittsburgh.—Demand for Barb Wire is dull, but it is expected to improve along in August or early in September, when fall trade opens up. We quote Galvanized Barb Wire $2.80 in carload lots to jobbers, and Painted at $2.50, terms 60 days net, with 2 per cent. discount for cash in 10 days.

Plain Wire.—The demand for Plain Wire continues light and orders are generally for small lots. Quotations continue as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes. Plain.	Galv.
To jobbers in carload lots	$2.15	$2.55
To jobbers in less than carload lots	2.20	2.60
To retailers in carload lots	2.25	2.65
To retailers in less than carload lots	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain Wire and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).

Nos.					Galvanized.
6 to 9	Base				$0.40 extra.
10	$0.05	advance	over	base	.40 "
11	.10	"	"	"	.40 "
12 and 12½	.15	"	"	"	.40 "
13	.25	"	"	"	.40 "
14	.35	"	"	"	.40 "
15	.45	"	"	"	.75 "
16	.55	"	"	"	.75 "
17	.70	"	"	"	1.00 "
18	.85	"	"	"	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Pittsburgh.—Demand is very light, but is expected to improve next month or in September, when fall trade commences. We quote:

	Plain.
To jobbers in carload lots	$2.15
To jobbers in less than carload lots	2.20
To retailers in carload lots	2.25
To retailers in less than carload lots	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

Henry Disston & Sons.—Henry Disston & Sons, Philadelphia, have announced that the discounts and prices which have been in force will be continued for the present season. While they do not anticipate making any changes, they reserve the right to do so if they find it necessary. They call the attention of the jobbing trade to the desirability of assisting them in their efforts to maintain the factory prices on their goods.

Atlas Mfg. Company.—The present price of Bradley's Wire Shelf Brackets, made by Atlas Mfg. Company, New Haven, Conn., is discount 80 and 10 per cent. in full cases, and discount 80 per cent. in broken cases.

Stove Boards.—The Stove Board market is characterized by much irregularity in prices, and some of the manufacturers are withdrawing from the market on account of the low prices which have been made.

Cordage.—During the past week manufacturers announced a reduction in the price of Manila Rope to 11 cents per pound basis. Sisal Rope remains unchanged in price, on the basis of 8¾ cents. Some manufacturers state that these prices apply to large purchases. The market, however, is in an unsatisfactory condition, and Manila Rope is obtainable on a basis of 10¾ cents, and Sisal Rope on a basis of 7¾ cents per pound for any quantity. It is not impossible that these prices might be shaded on desirable orders.

Binder Twine.—As the wheat harvest is reaching the Northwest, it is a time for general cleaning up of stocks of Twine. Those who have Twine on hand in that section are naturally anxious to unload, and to do so are making inducements in prices. Under these conditions it is difficult to give quotations that represent the general market. In the Northwestern States the market lacks stability, owing to a partial failure of crops, and consequent restricted requirements for Twine. Sisal and Standard Twine are quoted f.o.b. New York at 8 to 8½ cents per pound.

Glass.—There is an absence of interesting features in the Window Glass market during this quiet period. Factories are all closed down, and in the East jobbers are

distributing a limited amount of Glass. There is an intimation that a new list will be made in the fall, the principal change to be in the advance in the price of small sized Glass. The opinion is expressed that the American Window Glass Company have strengthened their position materially with the workmen by setting aside stock for their association. It is difficult to obtain small size Glass at ruling quotations. Prices are as follows to Eastern jobbers, in less than carload lots: Single strength—First bracket, 85 per cent.; second and third brackets, 85 and 10; all above, 85 and 25. Double strength—First bracket, 85; second, third, fourth and fifth brackets, 85 and 10; all above, 85 and 20.

Factory prices for carloads are as follows:

Single strength:

First bracket	85 and 10 %
Second and third brackets	85 and 15 %
All above	90 and 5 %

Double strength:

First five brackets	80 %
60-inch bracket	90 %
70 and 100 inch brackets, inclusive	90 and 10 and 5 %
All above	90 and 20 %

Paints and Colors.—*Leads.*—The movement of White Lead in Oil is confined to immediate requirements. The American Smelting & Refining Company announced another ⅛ cent per pound reduction in the price of Pig Lead on July 9. As a result of the fluctuations of raw material the trade are not anticipating their wants. Manufacturers' quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Oils.—*Linseed Oil.*—The Linseed Oil market continues dull and uninteresting. Very little new business is being transacted. The price of Flax Seed for September delivery has fallen off. Some offers have been made of Oil for delivery late in the year, but prices have not proved attractive to large buyers. City Raw Oil continues unchanged in price, being quoted by different crushers at 65 to 67 cents per gallon in lots of five barrels or more.

Spirits Turpentine.—Ample stocks and reluctance on the part of buyers of large quantities at this point, have been the prominent features of the Turpentine market during the past week. Prices have fluctuated a little, and are now ½ cent lower than at the time of our report last week—46 cents per gallon for Southerns and 46½ cents for machine made barrels.

Hardware Organizations.

Pacific Coast Hardware and Metal Association.

The Pacific Coast Hardware and Metal Association held its annual convention at Castle Crags, Shasta County, on June 25, 26 and 27. There was a good attendance of the members, comprising almost every jobbing house in this line on the coast. From the nature of the case most of their business was of an executive character. The reports on the trade aspects of the past year and the prospects for the coming one were most encouraging.

There were some resignations on the part of those who had held office for the preceding year. The president, Brace Hayden, president of the Dunham, Carrigan & Hayden Company, San Francisco, tendered his resignation, which was accepted with reluctance. Mr. Hayden has been president for a year and a half, succeeding B. F. Dunham of the Dunham, Carrigan & Hayden Company, who held the office for two years and a half, having been the first president of the organization. Chas. F. Tay, president of the Geo. F. Tay Company, San Francisco, was unanimously chosen to fill the position. Fred. Mottet of the Hunt & Mottet Company of Tacoma was chosen first vice-president; L. C. Scheller of the Union Hardware & Metal Company of Los Angeles, second vice-president; T. D. Honeyman of Honeyman, De Hart & Co., Portland, third vice-president; Joseph Sloss of Miller, Sloss & Scott, treasurer, while Thos. P. Smith, the secretary, succeeds himself.

The Executive Committee elected consists of Wakefield Baker of Baker & Hamilton, A. L. Scott of Miller, Sloss & Scott, H. J. Morton of the Geo. W. Gibbs Company, Andrew Carrigan, vice-president of Dunham, Carrigan & Hayden Company, Geo. S. Scovill of the Lloyd-Scovill Iron Company, and W. R. Wheeler of Holbrook, Merrill & Stetson, all of San Francisco. Brace Hayden, the retiring president, was placed on the Advisory Board. All of the gentlemen noted and some who retired have been conspicuous for their services to the cause of Pacific Coast trade in general during the past year. The convention was attended by some important coast representatives of Eastern trade.

A very pleasant dinner was given on Tuesday, which was attended by the members, their wives, daughters and visiting guests. The *menu* was excellent, while music, eloquence, wit and song rendered the occasion one to be long and pleasantly remembered by those who were present.

Texas Hardware Jobbers' Association.

The fifth annual convention of the Texas Hardware Jobbers' Association was held at Houston, Texas, on June 18 and 19. While the attendance was not as large as in other years, owing to the absence of a number of the members from the State, the meeting was one of the most successful held. A number of subjects were discussed and papers sent by absent members were read, showing that the interest in the work of the association is not lagging. The association now comprises 25 members.

The following officers were elected for the ensuing year: F. A. Heitmann, F. W. Heitmann & Co., Houston, president; J. C. Bering, Bering-Cortes Hardware Company, Houston, first vice-president; Ed. Strauss, Waco, second vice-president; Robert Eikel, F. W. Heitmann & Co., Houston, secretary-treasurer; Jas. Moroney, Moroney Hardware Company, Dallas; W. L. Sanford, Roberts, Sanford & Taylor Company, Sherman; R. F. Bell, R. E. Bell Hardware Company, Weatherford, and A. C. Goeth, Walter Tips, Austin, Executive Committee.

While in the city the visitors were entertained by the members of the association located in Houston.

As the Retail Dealers' Hardware and Implement Association of Texas held its annual convention at the same time, the delegates of both associations were invited by the Houston jobbers to spend the evening of the 19th as their guests at Angerhoffer's Park, where an elaborate lunch was spread and the jobbers and retailers had an opportunity of becoming better acquainted.

One of the pleasant incidents of these meetings was the invitation extended by the retailers to the jobbers to attend one of their sessions in a body. An address was delivered by the president of the jobbers' association, F. A. Heitmann, and responded to by the president of the retailers' association, Capt. W. H. Richardson.

San Francisco and Oakland Retail Hardware Dealers' Association.

The San Francisco and Oakland Retail Hardware Dealers' Association was organized at a meeting held in San Francisco on the 28th ult., when 22 members signed the roll. The following officers were elected: O. F. Sites, San Francisco, president; C. E. Nichols, Oakland, vice-president; Henry Gracey, San Francisco, secretary, and Mr. Joost of Joost Bros., San Francisco, treasurer.

T. E. OLIVER has returned from his annual visit to Charlotte, N. C., where he has been attending the annual meeting of the Allen Hardware Company, of which he is vice-president, D. E. Allen being president, and F. J. Oliver, secretary. The reports submitted at the meeting showed a very satisfactory year's business. The capital stock of the company is $50,000, paid in.

Letters from Hardware Manufacturers on the Business Situation.

The following advices from Hardware manufacturers in widely diversified lines will be of special interest at this time when the trade are watching closely the course of the market, and determining the policy to be pursued in the conduct of their business. It is gratifying to note the generally cheerful tone of the letters, and the fact that the situation, in spite of the break in the Iron market, is regarded as full of promise:

Wire Specialties.

The principal feature seems to be an old time desire to get rid of goods on the part of manufacturers making competitive lines. We think that this is explained by the fact that during the few boom months one and all made strenuous efforts to increase and improve their facilities for production, we among the rest. The result is that the same amount of help can turn out a largely increased amount of goods. We are running up against prices which are even lower than those ruling before the advance took place. This, notwithstanding the higher price of material to-day. Without being able to give any reasons for their belief, we think that the trade expect that the last low level of prices will not only be reached, but exceeded.

General Shop Supplies.

Our general business is very good. Numerous inquiries for prices, catalogues, &c., indicate to us that many new shops will be opened in the near future.

We have not made any advance in price on any of the specialties of our manufacture.

Axes.

Prices in our line are usually established for the year during the winter months, contracts being entered during the winter and early spring covering the wants of the wholesale trade for the year. Manufacturers are not, therefore, being benefited largely by the declining prices which have taken place on some items entering into the manufacture of Axes in the meantime, and, all important orders for Axes being booked, there is therefore no particular object in reducing prices at this time. There is an uneasiness on the part of the trade quite generally, all seeming to fear a break in prices before the end of the year. This disposition is manifested by requests to cancel in part and by submitting fewer specifications than contracts call for, or by deferring the submission of specifications. This feeling on the part of the jobbers results mainly from the fact that the retailers, noting the declining markets in general, are not ordering Axes for next season as early nor as freely as usual.

Our opinion is that the consumption of Axes during the present year will be larger than usual, and that this demand will fall upon the retailers during the fall and through them will extend back through the jobbers to the manufacturers, thus unavoidably greatly stiffening the situation as to Axes during the fall. It does not seem probable, therefore, that there will be a general reduction in Axe prices during the present year. Of course a few small factories without reputation are quoting at such prices as will effect sales and such quotations have a disturbing influence.

Should present conditions continue the price of Axes for next year, or after January 1 next, will undoubtedly be lower.

The above view is, of course, based upon the natural conditions as they appear to us. It may be well to add that in our line the incapacity or eccentricities of certain manufacturers might cause a reduction in prices without regard to the natural prevailing conditions.

Wire Cloth.

Our business for the past six months of this year has been very satisfactory to us.

In our Ornamental Iron the high price on raw material has restricted consumption to a certain extent, but since June 1 we have had a great many inquiries for this class of work and feel sure as soon as the price of iron becomes settled the consumption in the West on new buildings will be very much increased. Until, however, prices reach a more satisfactory level we do not look for a boom in the building line.

Twist Drills.

Never before in the history of this business have we been as busy at this season of the year as we are now. Something like two years ago we began to erect a large addition to the factory, which when completed would add about 50 per cent. to our facilities for manufacturing. Long before this addition was completed we were compelled, by the increase in the business, to install new machines in every nook and corner of the factory where we could find room. Several months ago the new addition spoken of was completed, and is now in full operation. Notwithstanding our increased facilities for turning out goods it has been, and is now, difficult for us to ship as promptly as customers would wish.

We are very aggressive in the search for business, and, as we usually hold a customer after we get him, the future has no scarecrows for us.

Screws.

We are experiencing more than the usual midsummer dullness, and this we partially attribute to the large purchases of the trade on advancing market during the last six months of last year and which it is now apparent were much beyond their actual requirements, as since February 1 the trade have been pretty generally underselling the makers' prices. This has increased to such an extent that they are to-day practically in control of the market. But evidence is beginning to appear that their stocks are depleted and will soon have to be replenished. Meantime we have maintained our prices and will continue to do so under the circumstances, as enhanced costs do not warrant any radical decline.

In addition to the causes above described for our usual midsummer dullness, we see evidences of a larger factor operating to deter a confident resumption of buying. In fact, all business undertakings to-day appear to be more or less overshadowed by the stress of adjustment to the new methods of producing and distributing consequent on the absorption of many individual competitors into combinations, whose fiat rules the component parts as if they were of one mind. What the political boss has been in politics is now dominant in many lines of manufacture, and many people tributary to such sources of supply are more or less alert to the instability of prices under such domination. The magnitude of these consolidated interests and the recent evidences of the power they wield introduces into all business dealings a new hazard, the extent and direction of which is as yet so illy defined as to deter would be buyers from moving forward as they would under normal conditions. We are all waiting for somebody to make a break, and even then we will wait to see how badly he gets hit before we make a venture.

Aside from these evidences of the depressing influences at work in the market we see no reason why there should not be an enormous volume of business done during the last half of the year, if something would only occur to restore the magic word confidence in the minds of the people.

Cast Iron Hardware Specialties.

We do not regard the present outlook as very flattering for business. Probably our experience is about

the same as other manufacturers, orders being light and far between. We have reduced our price somewhat, taking effect the 1st inst. It would seem the country is prosperous, but with a settling back to a normal condition, coupled with labor agitation and strikes, business is passing through a crisis.

Refrigerators.

The Refrigerator trade is in better condition than for many years. Although the projected combination fell through, the several meetings of the manufacturers effected much good. There is a manifestation to retain the good feeling and confidence in each other, as well as the enhanced prices. There does not seem to be any sign of concessions in the grade of lumber used, and we anticipate a good trade at present prices for next season.

Wire Goods.

While we hear more or less talk about the falling off of demand for goods, we are bound to say that there is a solid undertone to trade that is quite gratifying. Our sales for the past three months compare favorably with the corresponding three months of last year. While there is no undue rush to buy goods on a speculative basis, there is a steady demand for actual wants that makes it clear that the country is in excellent condition.

Bolts, Nuts, Etc.

We find business to be falling off both as regards quantity of goods ordered and also as to prices. Probably this is no more than might be expected on account of the majority of concerns to whom we sell our goods either being about to take account of stock, or else in the midst of it; therefore there is not so much demand.

We would say, however, that we should think that the outlook for business in the fall was very satisfactory. We are still running full time and with a fair quantity of orders. Of course, the price of our output is governed a great deal by the price of Iron, and this market, as you well know, is very unstable.

Augers and Bits.

The present prices on our line of goods will, without a doubt, remain firm for fall trade.

Horse Nails.

We find our forecast of the future condition of business made you in April strictly correct, although made with some hesitation.

The whole season, so far, has been taken up in reducing stocks and guessing where prices would land. Actual wants have been few, and factories have been forced to close down. In this way "cutting" will be avoided, and a stable price between the high figures of last year and the low prices formerly ruling will be firmly established, and prosperity will be continued.

The powers of the Old World will help China turn to better ways, and the African war will cease to be a menace to business, while the Philippines will become peaceable and turn under the guiding hand of Uncle Sam into ways that will soon give them a new and prosperous future.

Before the year closes all lines of business will be in good shape.

Twist Drills.

We feel that business at the present time is not quite up to the high water mark of last year, and we would naturally expect these conditions in a Presidential year, but think the conditions are not nearly as bad as they were in 1896 after the Democratic convention in Chicago.

The writer thinks that during the next two or three months business may be a little below what it was last year in corresponding months, although present figures would not so indicate, but he anticipates a quick revival of business after the election.

Hardware Specialties, Wood Novelties, Etc.

Our business from the beginning of the year until the present time has been very much better than last year. There are no indications as yet of any decline in prices. In our Hardware department July and August are the dull months, if any, during the year. We are receiving a goodly number of orders, and have no reason to complain. We have had recent communication with other manufacturers in our line, and find that there is no disposition to make any change in price during the balance of the year.

Hardwood lumber is not likely to change materially in price. Spruce and pine no doubt will drop a few points as the advance was very strong. The soft woods, however, enter very lightly into our Hardware lines.

It is probable the election may influence a few business people to some extent, but as a whole we do not consider that the coming election will materially interfere with business. The same is true with the prices in the Philippines and China.

Taps, Dies, Etc.

Our trade follows very closely as indicated by the barometer of our country's business, *The Iron Age*. We would say, however, we feel that when prices that have had a boom come back to their legitimate standpoint business will take a revival and we anticipate a good fall trade. Our prices were not advanced at the time of the general rise of material and general merchandise, and you will, therefore, realize that they are at a very low point. We feel as stated in your publication that while the jobbers and dealers are working off the stock bought at about the time of the rise, they are now buying from hand to mouth as their wants will require. This checks business, but with prices back to a reasonable advance, we feel buyers will take heart and put in good orders for stock.

Ice Cream Freezers.

We enjoyed a very satisfactory demand for our line of goods up to about May 1, since which time the demand has not been normal—in fact, not half what it was a year ago, and not over two-thirds what it was in 1898 for corresponding time.

The advance in the price of our goods this year, over last year, was about 10 per cent., therefore we cannot believe that the question of price caused the demand to fall off so sharply, but rather it was due to excessive purchases last year and early the present season in anticipation possibly of further advance in price during the past six months, which, of course, did not materialize.

We look for a smaller volume of business in all lines, ours included, until prices reach nearer their normal basis. Trusts and gigantic corporations may possibly have the power to temporarily advance and hold prices higher than normal conditions warrant, but, in the long run, the purchasing classes will settle this question, and settle it right. The law of supply and demand will adjust all these matters in the process of time. We do not look for any material improvement in business until after January 1, 1901.

Builders' Hardware, Etc.

The condition of trade in Builders' Hardware line this season is not very satisfactory. Last year it was booming and this year it is very quiet. Most of the trade have overstocked, and, with a feeling that the prices will be lower, no one seems disposed to buy ahead of their immediate wants. We anticipate, however, a fairly good fall trade, as most of our customers have been working off their stocks and will probably be in the market about that time.

Labor troubles and high prices have retarded building operations, which affects our line of goods materially, and, of course, the presidential election has its influence. Our sales on the whole are in excess of last year, our foundry work having made up the shortage in other

LETTERS FROM MANUFACTURERS, Continued.

lines. Trade, as a whole, is assuming a more healthy and conservative basis.

Saws.

We are not at all pessimistic regarding the outlook for business during the balance of the year. We are still very much rushed getting out goods for shipment during the next few months, which orders we took during the spring, and the cancellations we have received have been very few. There has, of course, been a slight falling off in new orders during the past four weeks, and from reports received from our traveling men through correspondence, this falling off, as well as the cancellations we have received, have been on account of the frightened condition of the minds of some of the Hardware merchants, which we believe they will be ashamed of in a short time.

There are some who think that prices should be reduced on our line of goods, but they fail to take into consideration the fact that the advance we made the first of the year was exceedingly small, and as there has been no drop in the crucible steel market at the present time, we, of course, see no reason why we should make any reduction in our prices.

Taking it altogether, while we appreciate the fact that a Presidential year always has more or less effect on trade and that a tendency toward a reduction in the iron and steel market is sufficient to make buyers more cautious, yet at the same time we are feeling very hopeful and will look on the bright side of things for the next six months, and we believe that results will justify our position.

Bolts, Nuts, Etc.

We are pleased to state that at the present time we are very busy, our shops being filled with orders. While orders are not coming in as fast as has been the case in the immediate past, we are kept busy, and do not expect any large decrease in business for some time. While there have been several reductions in price within the past few months, we now expect that we have reached a level where they will be maintained.

Tackle Blocks.

At this time we are unable to say what course prices on Tackle Blocks will take. Our feeling is that the rates of the past six months should be continued. Our advances were most moderate, and we consider Block makers entitled to the additional margins to be secured just now due to decline in cost of material. It is a matter for the makers alone to decide, as there is very little demand from buyers for reduced rates. Orders for stock are naturally being held up, but the requirements for immediate needs are such that we are rushed in every department. In fact, the conditions are such that we look for a continuation of the present active demand for some time to come.

Saddlery and General Hardware Specialties.

The demand for our specialties in Saddlery, Coach and General Hardware continues strong, and we have every reason to think we will have as good if not better a year than was 1899.

Files.

We find trade very quiet and do not anticipate much of an improvement before late in the fall. Most of our customers bought very heavily before the raise, and owing to the unsettled condition of the steel market they are now either working off this stock or buying very sparingly, anticipating further declines, and do not expect them to be in the market to any extent until they are satisfied that the steel prices are quoted down to the very lowest.

Staples, Double Pointed Tacks, Etc.

While trade has been very quiet with us as compared with the last and previous years, still we think we have noticed a slight improvement in the last two or three weeks. In fact, our sales for June were a little ahead of sales for May. The disposition on the part of buyers, however, seems to be to buy in very small quantities and only for immediate needs. Some of our largest customers, after writing for quotations, have advised us that they would only buy as they required goods, as they believed the market would continue to settle for some time. The signs would seem to indicate that stocks were very low in the hands of dealers and consumers.

For this reason we think that there will be a little more active demand than there has been, but it seems doubtful if there will be any heavy buying until the market has settled considerably more. When such heavy staples as pig iron and steel billets have apparently reached their normal level, it is likely that all manufactured articles will adjust themselves to this basis, and then it is to be hoped that the demand will improve.

Hardware Specialties.

It is very difficult to give an opinion regarding the market, for the reason that the materials used in the manufacture of our goods are controlled by the large combinations and trusts, and no one can tell what action they may take in an endeavor to stimulate trade. Our idea, however, is that to cut the prices now arouses a feeling of uncertainty among buyers, and instead of placing orders they hold off for further declines. We think the greatest mistake of this kind was made by the American Steel & Wire Company when they made such a radical reduction in Nails and Wire not long since. Customers everywhere got the impression that everything else had dropped accordingly, and all wanted to know whether prices on our goods had not been lowered. The fact is that goods, such as we manufacture, have not advanced at all, except some few articles, and these have not been advanced as much as the advance in Iron and Steel would have compelled us to had we not had contracts in at lower figures.

We think that the summer trade this year will be exceedingly light, and as business is always dull in Presidential years we do not look for much trade before election. At any rate buyers seem loath to place orders ahead unless prices are guaranteed up to time of shipment.

We doubt very much whether next season will be as prosperous a one as the past spring was, as business is always better on a rising market; besides there was much speculative buying done during the past 12 months by parties who really did not need the goods, but bought because they thought that they could not replace them very soon at the same figures.

Spring Hinges.

The very conservative course on the part of buyers and their efforts to obtain lower prices generally has had its effect on several lines. One of the most disturbing factors has been the unloading, on the part of jobbers, of excess stock of goods purchased last year, at cut prices. Manufacturers have been affected by these lower prices, and in many cases it has led to distrust as to whether the disturbance was caused by the action of fellow manufacturers or only by the jobbers. Under these circumstances some manufacturers have not acted with good judgment, but have hastily made reductions which have led to a break in prices.

We believe there is a general conviction that there should be a reduction in price on most articles, especially if there is a decided reduction in raw material, and we believe there is a willingness to do this in a general way when the situation is fully understood. There is no time in our opinion when manufacturers should stand together more than at the present time, and to make such reductions as seem to be warranted in an orderly and prudent manner. It is a very easy matter to demoralize the market, waste profits unnecessarily, and to get back to the ruinously low prices ruling for a long time previ-

ous to last year. Such a state of affairs is not only hurtful to the manufacturer, but of no advantage to the jobber or other distributers of goods, and the efforts of buyers to break down prices in any way possible are not justifiable, nor is it good business policy.

Stocks and Dies.

Up to the present time our trade has been very satisfactory, and we are looking forward to a good trade during the coming season.

Hardware Specialties.

We look upon the market conditions with a very favorable eye. We think some manufacturers are again making an error in becoming rattled over the comparative smallness of business. It is hardly fair to make a comparison of the volume of business transacted this year with the same periods of last year. In the Iron and Steel and allied trades last year was in no sense a business year, but it was in every sense a speculative year. Consequently we think it wise to make the comparisons of this year's business with the years previous to 1899.

We think many manufacturers last year made the mistake of advancing prices too rapidly and too much. They did not sufficiently consider the fact of its being a speculative year. Now these same manufacturers are inclined to make a second error in becoming demoralized when the excess business transacted by them last year is finding a market through commercial hands. We think this condition cannot last many weeks, and therefore conclude that a very satisfactory volume of business is in sight if not in hand.

Gun Implements.

The situation in our line we can sum up in a few words—it is eminently satisfactory.

Farm and Garden Tools.

We are at present, as might be said, "between hay and grass." Just finishing up one season, and will not enter into the next until probably some time in September, so that it is yet too early to form any conclusions as to what conditions will be then.

Our line of goods are seasonable, and are marketed in from six weeks to two months' period. It is our opinion that jobbers are carrying over from this season very few goods, and are hopeful that market conditions will be satisfactory, and the demand at least normal.

As regards the past season, we might add that we are quite well satisfied as regards the amount or volume of business done, although the demand has been rather disappointing during the last two or three months, owing partly to poor crop prospects, and partly, doubtless, to the apparent slumping in prices in many lines.

Steel Roofing, Ceilings, Etc.

Business in our general line is quiet, while in our line of special work we are quite busy, and from present indications we think we will be busy in this department for some little time to come.

Plumbers and Steam Fitters' Supplies.

We find it extremely difficult to come to any conclusion as regards the future of trade and prices of goods in our line.

Our policy has been for some months past to buy only for immediate wants, unless purchases are guaranteed by the seller. We shall continue to buy in the same way until bedrock prices have been reached.

While we cannot complain of the lack of orders and the volume of business now being done in our line, as when we consider the high prices of material, building in this locality has been active, but prices received for material low, as all manufacturers have been anxious to unload stock bought at higher prices. Our judgment is that we cannot look for an active, profitable movement of our line of goods before next spring.

Hardware Specialties.

Our prospect for future business seems very good, and although we shall probably have a more quiet time this summer than a year ago, we anticipate a good fall trade.

As to prices, we look for some further drop in them; but confess we are not in a position to predicate very far ahead. If buyers were once persuaded that the bottom had been reached, a buying movement, which would naturally set in, would certainly stiffen up prices all along the line, as we believe stock of Pig Iron in consumers' hands to be light.

Door Hangers.

The situation appears to us to be bright and the outlook is by no means discouraging. Our business was never better. As manufacturers we feel that it is an important time and very essential that the jobbers who have large stocks of goods bought at old prices, which is generally the case, can well afford to hold the goods, and the prices as well; otherwise they will become competitors of ours, and serious results will follow.

Hollow Ware.

This is the time of the year when our trade drops off. We look for a good trade the coming fall from the fact that the buyers last year bought very heavily and but light this spring. As all of our men are off the road at this time we hardly know the pulse of the trade, and our opinion would be greatly influenced by the talk of our customers. However, we look for a good fall trade and shall be ready to take care of it when it comes.

Farm and Garden Tools.

There will certainly be no change in the prices on steel goods or on Snaths for the current season, nor will there be any before the prices are made up for the season of 1900 and 1901, and this will be some time in September.

The advance in steel goods in the spring of last year was a very moderate one compared with the advance on like goods, such as Scythes, Shovels, Spades, &c., and they still remain fairly related to the present reduced cost of steel.

Orders to the manufacturers for the past two months have been very light, and the jobbers are going to reach the end of the season with very light stocks on hand.

Axles.

In our view the market for our line of goods is not in a very satisfactory condition just now on account of the rapid decline in price of Steel. This seems to upset the calculations of parties who have contracted for goods to be delivered through the entire season, which ends on August 30. A large share of our trade is contracted by the season, and usually we are receiving orders continuously all the year round. At present we are not receiving orders that we should have, because, as we mentioned before, the Steel is declining in price. The jobbers who handle our goods state that if they buy goods now at present prices they cannot sell them without a loss, and therefore think that they must withhold orders until after a change in price. We have not as yet made any change, and do not propose to until the close of this season. The fact that buyers are withholding orders, and will probably withhold orders through July and August, indicates that after the first of September business must be very brisk indeed.

Taps, Dies, Etc.

Trade continues brisk with us. While it is not crowding us as badly as it was the first of the year (and we never expect it in the summer months) we have all we can attend to.

Taps and Dies were not advanced and the jobbers are not waiting for the turn of the tide, which is the case on many lines.

As soon as values are on a solid basis, a large business is inevitable. We consider the prospects for the balance of 1900 good.

Sash Weights.

The Sash Weight manufacturers of the United States have decided to maintain prices, and as we are now at the

LETTERS FROM MANUFACTURERS, Continued.

beginning of the busy season, we feel sure that there will not be any change in price until after the first of the year, unless it is to increase the price in certain localities. Several of the Western points have increased their price within the last ten days and we believe it will not be long until there is a uniform price. The settlement of the great labor strike of Chicago will relieve the conditions there, and as that was the only weak point in the Sash Weight trade, we feel very hopeful of the future as to price; and as to volume, that depends upon the number of buildings erected and not upon the price of Weights.

Builders' Hardware, Etc.

In our opinion the halting condition of the market is a natural reaction from the excitement and over purchasing of last year. The actual consumption of goods in this country is probably greater now than ever before, and, if so, will very soon absorb the excess stocks in dealers' hands and lead to renewed business for the manufacturers. The process of reducing stocks is trying and perhaps somewhat tedious, but none the less necessary; the generally prosperous condition of the country should give confidence and cause manufacturers to wait patiently while the process is completed.

Undoubtedly prices of goods which are not far removed from the raw material must decline in sympathy with the latter, and the more speedily this is accomplished the better it will be for all concerned. In more highly finished products, however, the moderate advances in labor have largely balanced the small declines in material, leaving no fair reason for declines in prices of such goods except where the advances made last year were abnormal and out of proportion to the increased cost, which certainly was not the case with the general line of Builders' Hardware.

The pendency of a Presidential election is always an impediment to business, but, barring this fact, we believe that as matters now stand the business of the last half of the year will be distinctly better than of the first half and fully up to the normal average.

Door Hangers, Vises, Etc.

Trade is very light at present. Buying is limited to immediate wants, which should result in stocks being largely depleted by fall, so that we are then looking for a good business. We have made no change in our prices.

Tackle Blocks.

Our sales this season up to date have been very satisfactory. Prices, although close, have been well maintained, with but little complaint of cutting, and that only from parties who were either overstocked or small manufacturers who were not well posted as to the cost of their products, and who were not able to market what they thought to be their proportion of goods at even prices with the larger concerns.

As to the second half of the year, while we are hopeful, we confess that we do not feel sanguine that it will compare with last year's business as favorably as the first half. For the next month or two we are prepared to face a more quiet market, as many dealers seem to have a wrong impression that on account of the decline in Iron and Steel there should be a corresponding decline on Blocks and Trucks.

It is evident to us that at the present cost values, considering the decline on materials, our goods are not paying us the profit they ought to. This is owing to the fact that the Block makers were slow and timid about advancing as fast as they ought to, and had the former high costs been maintained the present price of Blocks would not have been equitable.

One great trouble seems to be that the trade take for their cue certain lines that have been advanced and held at a fictitious value, and they seem to have the impression that all manufacturers' goods should be subject to a decline without regard to conditions, the same as goods that had been advanced to a fictitious value. Writer's mind is that the sooner these fictitious values are reduced to a hard pan basis the better it will be for all concerned and the sooner the trade will again assume its normal condition.

Brass and Copper, Etc.

Orders are not as good as they were. We have not made any change in prices. We think our business has fallen off in some lines about 50 per cent.

Mechanics' Edge Tools.

We hardly think there will be as large a demand for goods in our line during the next few months as has been enjoyed by the manufacturers during the past few months, but we hardly look for any change in our prices for the reason that they were not advanced in proportion to the advance on raw materials, and the present prices are close, notwithstanding the reduction in the prices of some articles that go into their manufacture.

Wagon Hardware.

It looks as if trade, at least in the Heavy Hardware, has recently had much the same experience as Betsy's pig, "When it lived, it lived in clover; when it died, it died all over."

Generally a very fair and in many cases a good trade is reported in Wagon Hardware between the consumer and merchant. But the trade between manufacturer and merchant is very poor, and we think it does not take much of a prophet to see that it will not be materially better until the trade believes the bottom has been reached. If some one can tell us when this will be, please be sure to let us hear of it.

Files.

We look for a conservative and hand to mouth business for the next two or three months. Aside from the doubtful crop prospects in some sections of the country, we see no clouds upon the business horizon that would indicate other than that we are to receive a fairly satisfactory business during the late fall months.

The prices of Files did not materially advance, which is a very good reason why they will not decline. At the last meeting of the association, held late in June, it was the unanimous expression of the members present that existing prices would be maintained.

Axles.

The very marked reduction in the price of metals has very much reduced the volume of our business for the last half of the present season. The sharp advances of last year stimulated buying to an unusual extent, and the consequence is that the market has been overstocked in not only our finished material, but the finished material of our customers, and a part of the dullness of the present time may be to some extent attributed to this. Buyers are waiting and taking only what they are compelled to have to supply their immediate wants.

We have every reason to believe that throughout the greater portion of the country the business of the coming season will be extremely good, and we shall go into the season without a large quantity of goods on hand and have a better than the average year. The outlook at the present time is very encouraging in that direction.

No change has been made as yet in our prices. We anticipate, however, that a change will be put in effect within the next ten days, showing very material reduction.

Carriage Hardware.

We have not been out among the trade since last April. Our contracts with Carriage builders are, as a rule, made in the fall, and for a year, and the greater part of our Carriage Forgings go directly to the builder. You are well aware of the fact that whether the Carriage

builder has a good year or not depends upon the general prosperity of the country, and especially of the farmer.

As to the metal market—that is, for prices upon what is our raw material—we are looking to *The Iron Age* and the trade reports in general for a guide.

Our orders seem to indicate that the Carriage builders have been having a good business, which has held on somewhat later in the season than usual, and we know that they have been aiming to carry over as small an amount of material as possible.

Orders received quite recently from jobbers indicate that their stocks in our line are also very much reduced. It would seem fair to argue from these facts that, when once the prices of iron and steel are settled, there will be fairly liberal buying.

Curry Combs, Etc.

This is invariably a dull time of the year with us, but from our point of view the outlook is promising for a fair volume of business this fall. The demand during June improved relatively so much over the few preceding months—when, indeed, under general conditions the reverse would be quite in order—that we feel that consumption has to a large degree at last made good the anticipatory purchases of the previous season; and fortunately advances in our line of output during the past 18 months have been so conservative we feel that this factor in turn is giving a stability to prices that otherwise could not reasonably obtain.

Mechanics' Tools.

Regarding the matter of trade outlook, which we have given some study and upon which subject we find there is a great difference of opinion among different manufacturers and among people in close touch with the trade, we do not anticipate more than the ordinary volume of business the coming fall, still we believe that the wheel of consumption is turning pretty rapidly, and that the demands of the consumer will occasion a considerable volume of business. We don't believe that our customers are overstocked with any of the articles which we manufacture. We can go still further and state that we do not believe they have even fair stocks, except, perhaps, in a few individual instances. Labor disturbances are bound to have a depressing effect upon the sale of tools, still we do not find that the pawn shops are as yet overloaded, and this is one of the first places we look, knowing that as soon as a mechanic is out of money he will put up his tools for what he can get on them.

Our export trade is more than good. This has so stimulated our sales that we find that our stock of finished goods is hardly sufficient for present requirements, and should business be even less than ordinary we should hardly curtail our production until after January 1 next.

While prices of crude stock are considerably lower we do not believe that special material has declined to any extent, neither do we notice any disposition, or, perhaps, we should modify this and say but little disposition, on the part of manufacturers of machinery and supplies to shade their prices.

Collections are good, and as far as we have been able to investigate, retailers are still quite busy; we have no intention of making any change in our selling prices, and to sum the matter in a nutshell we believe there will be a healthy volume of business for the balance of the year.

Cordage.

We find on comparing notes with other manufacturers that our experience this spring has been similar to the majority—viz., plenty of business for the first four months and scarcity of orders the last two months, all buyers apparently having agreed to purchase nothing but what they are absolutely obliged to buy, and we think this condition will continue for at least another month. Prices are now very close to cost. We look for a fair trade during the fall, and we expect the year 1901 to be an exceptionally prosperous one.

Tools and Supplies.

Our business has been very good for the first six months of this year, somewhat better than for the same months of 1899. For the past 30 days business has been gradually falling off, although the present volume of business is very satisfactory, and we have quite an amount of unfilled orders to ship.

It is our impression that for the summer months business in our line will be rather quiet, although we expect a fair volume. Should the Presidential election seem favorable for the continuance of the present administration, we look for an increasing business after the summer months are over, which will continue indefinitely. At the present time manufacturers are catching up on their unfilled orders, and, unless checked, there is likely to be a surplus of stock on hand. We are fairly well satisfied with present conditions, and are hopeful for the future.

Butchers' Tools, Etc.

While we are aware there appears to be a decline on a number of lines of goods in the Hardware trade and buyers appear to be generally looking for cheaper prices, the present prices on our goods are bound to hold out for the reason that the slight advances we made about a year ago were not owing so much to the additional cost of manufacture as to the extremely low prices then prevailing, which would have compelled us at some time or other to make small advances even though materials had not increased.

Horseshoes.

Machine made Horseshoes have had about the same experience as other lines of Iron and Steel wares during the past eighteen months.

Jobbers largely overstocked themsleves during the advancing months of 1899, and this kept the Horseshoe plants extremely busy until some time in February, 1900. The winter of 1899 and 1900 proved extremely unfavorable, especially in the West and Northwest, for sharp shoeing, and the sales of Shoes were comparatively small; in consequence of this, the three months, March, April and May, were perhaps the dullest ever experienced by the Horseshoe manufacturers in this country. About June 1 stocking up orders for small lots began to come in; early in June a reduction was made by all manufacturers in prices; this did not prove a tonic, but, on the contrary, had the effect of making buyers still more cautious. The market to-day is a waiting one; there would be no difficulty, however, in filling our order books if we would guarantee prices; this method has been the bane of the trade in the past, and is not likely to become a rule in the immediate present, if at all in the future.

From the tone of our correspondence, covering the entire country, we are satisfied that stocks in merchants' hands are very greatly reduced. The fall demand generally begins early in July, and in our opinion the demand for fall and winter Shoes this season, while coming in somewhat later than usual, will be large and urgent. As near as we can ascertain stocks in manufacturers' bins are not excessive, and it is probable that buyers will find difficulty later on in getting their orders filled as promptly as their needs require. This will be no new experience, as it is but a repetition of the past for a number of years.

The jobbing prices of Shoes to-day are about the same as they were during the low priced periods of 1894 and 1895; not as low as they were in 1897 and 1898, when prices went to a point that compelled several of the Horseshoe works to go out of the business, but in those years raw material and labor were nearly 30 per cent. lower than they are to-day.

General Hardware.

Trade just at present is extremely quiet; as to the future am making no predictions; it is too un-

LETTERS FROM MANUFACTURERS, Continued.

certain to stake one's reputation as a prophet, especially after the experience which we have gone through during the past 18 months. The country as a whole is prosperous, there is plenty of money and there ought to be a good demand all through the fall, but we are on a falling market and extreme conservatism in buying will be the rule until prices settle back to a lower level.

This is speaking in a general way, and has no special bearing on our own line of goods, except that trade is very quiet.

Glass Cutters, Etc.

You are kind enough to ask me for my opinion on the present business outlook from my standpoint. Sometimes I think I have a standing on my standpoint and sometimes I don't. You know I have been in a line of business that I may be more or less identified with for over 30 years, and in that time have been through booms and depressions leading almost to panics, and of the two, from my standpoint, I had almost rather face the latter. If the boom fellow, when the fever is on, in looking around, could hit on something else than the particular article or articles I am interested in, I could probably indorse the boom, but somehow he doesn't. They seem to have a particular fascination for him, and he sails right in with the result that a lot of stuff has got to reach the scrap heap or go on the market, and it usually does the latter as the most favorable alternative.

You see, I take a conservative view of things in a business way; am ready to do my best to meet demands, but not inclined to anticipate events to any great extent. I rather lean to the idea of taking a fair slice off my neighbor and giving him in return a small slice, allowing Mother Earth to make up the balance. In other ways your boom fellow has got it in on me. For several reasons I have not found it expedient to advance prices while paying him for important supplies an advance of from 25 per cent. up. Many of my customers like to feel they have a fixed price, and then again on foreign trade it may be months, sometimes years, before getting an order based on prices quoted. And many domestic orders come in stipulating no advance from previous prices. A refusal to accept the order would probably in most cases simply let the other fellow in. There is just one way I, in a measure, retaliate on this fellow, and that is by buying of him in some instances probably one-tenth the quantity at a time—just enough to keep along—and I know that means cutting his profit to some extent.

From present indications, my business seems to be improving, so judge that business generally is gradually adjusting itself to normal conditions.

We have been swapping Jackknives for mules, but most of the latter have been sent out of the country, only a few left to kick, so I suppose we will have to come down to simply swapping Jackknives again.

Graphite, Lubricants, Etc.

As far as the months of the present year have gone by, as far as our touch with the market at present is concerned, and as far as we can see into the future, the conditions of business seem now to be in quite a healthy state. We do not hope for the active business from now until January that we had in the last six months of 1899, but still we hope for and predict a good demand along our lines.

Screw Cutting Tools.

Present indications look very favorable for a lively fall trade, as we are fully three months behind on orders at the present time, and they are coming in fast.

Pruning Shears.

The Pruning Shear business has not been as satisfactory the last year as for several preceding years, and we do not see how prices can be reduced even though materials yield a trifle. Prices were well maintained last season, but we know business was light by comparing notes with our competitors. We do not believe articles that were advanced conservatively will shrink in price to any extent, but do believe where values were inflated a radical drop must come.

Hardware Specialties.

My trade has been unusually good this season, which is to me an indication that the financial situation among moneyed men is favorable. This class of goods being a luxury, is one of the first to feel the effects of hard times, and good times brings a corresponding reaction.

Wrenches, Vises, Etc.

We find no room for pessimism in the outlook. We are satisfied that the consumers' demand for goods was never better. After careful study we conclude that the retail trade are selling a larger value of assorted merchandise in general Hardware than last year.

While dealers are slow to order for stock because of possible reduction in prices to be looked for, the aggregate of small orders shows clearly the rapid reduction of their stocks, and so soon as the trade are satisfied that all possible price reductions for the present have been realized, as must soon be the case, we anticipate that manufacturers will be fully occupied in meeting the legitimate demands.

We are aware that labor disturbances and crop prospects, and the influence of the Presidential election must not be overlooked, but, so healthy are the commercial conditions, and so prosperous are the people as a whole, we cannot but regard the business outlook as full of promise.

Bolts and Nuts.

Our present business is very small and unsatisfactory. We have just closed a year which has been the largest ever recorded on our books; from July to July. About two months ago orders fell off, and notwithstanding our persistent efforts to obtain business we have not yet been successful in getting sufficient orders to keep our factory in operation. We do not look for any immediate change in the present conditions, and hardly expect trade to increase until after our fall elections. We are having gloomy reports from the Northwest in regard to grain, which will affect materially some of the largest implement manufacturers, who have been buying from us largely. However, the general prosperity of the country has been such that we think with a continuation of the present administration of public affairs that a fair business may be counted upon after November.

We do not believe that prices will be as high for the next 12 months as those we have just passed. The present depression, we believe, can be partly attributed to the excessive prices of material this last year. Many large consumers and dealers had large contracts at lower prices, which when filled gave them the working stock for some months to come, and when these stocks are worked off we will have a resumption of business which in the main, we think, will be satisfactory to all concerned.

Tools and Implements.

At this season of the year we expect our business to be dull, although we notice some falling off in our sales, as compared with last year at the present time. This falling off is attributed to the short crops which are reported in several sections of the West. We believe, however, on the whole that our profits will be fully up to the average year's, and had it not been for the trouble spoken of above, we would have far exceeded former years.

Shears and Scissors.

The first half of this year has been a good one for our Shear business. We are now between seasons, and buyers are only buying for immediate requirements. Prices have remained firm, with no indications of lower prices.

Step Ladders, Trucks, Implements, Etc.

We are pleased to state that business in our line is very active, and the outlook for summer business was never better. Orders are now coming in quite freely for summer goods, and we feel very much encouraged at the outlook.

House Furnishing Specialties.

I am considerably at sea as to what the market will be for the last half of 1900, but do not expect it to be very satisfactory from a manufacturer's standpoint. While some goods were advanced far beyond the increased cost, a large majority were not advanced as much as the advance in the cost of production, still the Hardware trade throughout the country look for greater reductions in prices than it is possible to make without selling the goods at an actual loss.

There will undoubtedly be a revision on pretty nearly all goods in this line of business when the traveling men are started out on their fall canvassing tours. There will undoubtedly be a very great reduction in the amount of stocks on hand by the Hardware jobbers, and they will be compelled to come in the market before long to buy, and if the manufacturers will only hold their prices at a figure that they can make a fair margin of profit, they will all be able to sell such goods as the trade demands as well as if they made a very great sacrifice.

Hardware Specialties.

Our opinion is the present condition of business is largely due to over purchases on the part of jobbers, and overproduction on the part of many factories, and while we do not think there will be as large a volume of business during the balance of this year as last, we do look for a fair amount of business, and the general impression seems to be that orders will be given a little earlier than usual, and while they may not be for large amounts, jobbers will order frequently.

We have made some slight reductions in our prices, but as we did not raise our prices very much we did not have very much to drop.

Machinists' Tools, Etc.

We have had an exceptionally satisfactory six months' business this year. We consider the outlook as very encouraging, although we expect a slight falling off in business during the summer months.

Dumb Waiters, Etc.

From our standpoint business is extremely good, and the outlook for the future in the building trade, from which we derive most of our business, is very bright, and we believe that the coming fall and winter will bring most excellent business throughout the country.

Files.

We take rather an optimistic view of the situation. We are very busy at the present time, and feel that this condition will continue, notwithstanding the recent reductions in some lines, which you will note were those that had been increased in price for speculative reasons.

We have made no changes in our prices, nor do we expect to make any.

Mechanics' Tools, Etc.

Orders for Hardware in our line have been very quiet since January 1. On Drop Forgings we have been running right up to our full capacity, and also on Pamphlet Stitchers and Type Setting Machinery.

A year ago the Hardware dealers bought very freely of our line. We have some unfilled orders yet. Possibly this may in part account for the dullness in this line.

Hangers, Etc.

Our trade the past month has been as quiet as any month we ever had. We believe, however, that as soon as the trade are satisfied that bottom prices have been reached, business will be all right. At present dealers are inclined to buy nothing they can possibly get along without, and then in small quantities. Dry weather in some parts of the country is making the trade feel like holding back, and unless we get more rain very soon, crops of some kinds will be rather light. Our traveling men seem to think fall trade will be good.

We think dealers are doing a pretty fair trade, and in a few months will be obliged to replenish their stock. We believe the light trade is caused almost entirely from the fear of lower prices, but so far as our line is concerned, we do not expect to reduce price this year. Our goods were never sold at the increased cost, and are bringing but a small profit at the present price of Steel, and unless Steel declines at least another $10 per ton, there will be no reduction in price of Barn Door Hangers and Rail.

Tacks.

The Tack market is in a very unsettled condition at the present time. We trust that in the fall prices will rise a little. It certainly does not seem as if they could go very much lower than they are now.

Hardware Specialties, Vises, Etc.

This is our natural dull season. We also find in connection with this that the trade has been buying very conservatively for the past 30 days. We anticipate that it will be a very slow business for the next 30 days, since a falling market is always awkward, to say the least. We believe, however, as against the present situation that matters will clear up in the course of the 30 days after Iron and Steel have settled back to the normal price, and that we will have a very good demand for our goods about August 1.

Brooms, Foundry Supplies, Etc.

Orders received during the past few weeks have been considerably lighter in number than during the same time a year ago.

In our Foundry Supply department, we find that there is a disposition on the part of most foundrymen to buy sparingly. This is the time of year when most of them are closing down for annual inventory and repairs, and, in addition to this, the decreasing demand for Castings has put many foundries in a position where they have an abundance of supplies to meet present requirements.

We are inclined to consider the prospect of a quiet summer as rather a favorable indication, and believe that business conditions are simply striking a more normal level. We confidently expect a good fall and winter.

Among the Hardware trade, to whom we sell Push Brooms and various lines of Brushes for household use, we find quite a disposition to delay buying, hoping for lower prices. This, however, is absolutely out of the question in the lines above mentioned. Take, for example, Rattan or China Reed Push Brooms. The fiber going into these goods costs twice as much to-day as it did a year ago and, with the present war in China, there is every indication that it will be much higher.

The same condition prevails regarding Chinese bristles, and all other imported bristles are from 25 to 50 per cent. higher than they were a year ago, and, being quite familiar with the foreign market, we can see no reason to look for lower quotations.

Twist Drills.

Our works are very busy; in fact, we have as many orders ahead as we have had at any time during the past year. Business outlook seems encouraging, and we think that larger orders will be placed for goods the latter part of July or early in August, as the jobbers are holding off and only buying their requirements from their neighbors, rather than buy goods from the factory, as they feel that prices are so high, and, of course, their stock is getting low, and they are merely waiting for a more settled condition of prices.

As regards prices on our products there is no immediate decline, as the tool steel which we use will not be bought at a lower price, and certainly labor is just as high to-day as at any time during the past two years.

From an Australian Correspondent.

MARKETS.—Business here continues very good, with a more than hopeful feeling among merchants with regard to future possibilities of trade. There is, of course, some uncertainty regarding political questions and the future Australasian tariff, but it is early yet to consider this.

PRICES in the English and American markets seem to be well maintained, and buyers are coming forward more freely now that there are no signs of a fall in the immediate future. South African developments are confidently looked to to maintain prices for a longer time than would have been the case but for the war.

THE BUSINESS CONDITION.—Business here is being conducted on better and sounder lines than has been the case for many years past. The high prices are beginning to lose their hitherto somewhat retarding effect on the sale of goods of the heavier class. Labor is in good demand at good wages, and the depression of a few years ago appears to have taught the masses a salutary lesson in saving money.

GOODS IN DEMAND.—Industrial Tools are in very good demand of late, the mining business, engineers and foundrymen being kept going steadily. Builders' requirements are also well to the front. Galvanized Iron, Fencing Material, Rabbit Traps and Household Ironmongery have had a good month.

GERMAN COMPETITION.—Barb Wire, especially German, has had good sales. Our German cousins announce their intention of doing their best to win this market in Barb Wire and to oust American makers, but they have a hard task and a long journey in front of them. German Wire is not generally considered to be up to the standard maintained by it some years ago, and some of the leading houses here have not been importing it of late.

NEW ZEALAND.—This energetic colony is said to be shortly going in for a great public works policy involving a loan of £4,000,000. There is no doubt that such a loan could be readily and cheaply negotiated, for New Zealand is one of the brightest jewels in the British crown, not merely from the sentimental point of view, but viewed in the cold commercial atmosphere of hard business. The trade returns for the year ending March 31, 1900, show exports to the value of nearly £13,000,000, and imports a little over £9,000,000, showing an excess of exports over imports of nearly £4,000,000.

HARDWARE.—The general Hardware trade of New Zealand is in a very satisfactory state at present, and Hardware travelers always speak in glowing terms of the promptitude and businesslike manner adopted by New Zealand traders.

NEW STEEL COMPANY.—The Steel Company of Australia, Limited, have issued their prospectus for the acquirement of a Steel foundry at Brunswick, Melbourne, and the patent rights in respect of the Heskett-Jones process for the manufacture of Steel. The company are expected to be successfully floated with a capital of £20,000.

BALLARAT MINING EXHIBITION, to be opened in Ballarat, in the heart of the Victorian mining district, in November next, may possibly be worth the attention of American makers of mining specialties, if they have anything new and of special interest to show.

THE BUBONIC PLAGUE is still with us, and covered Galvanized Dust Bins and Rat Traps still sell merrily. The Melbourne municipal authorities, immediately on the first case of true plague appearing, raised the price at which they would buy captured rodents to sixpence each, and rat catchers are having a good time in consequence.

In Sydney the Government have decided to resume possession from present private owners of a number of wharves and streets within the infected area. The buildings thereon are to be destroyed, and within a couple of years' time Sydney will possess some of the finest wharfage accommodation in the world. The cost of resumption will be something like £2,000,000.

SANITARY APPLIANCES.—The effect of this epidemic, from a trade point of view, will be to largely increase the demand for sanitary appliances. The Sydney Municipal Council has slumbered peacefully for years, and property owners in their city have allowed tenements to fall into every kind of disgraceful disrepair. The plague has been a rude awakening to the disgracefully unsanitary state of the city. Recently, as the result of two days' work, the inspectors reported on 200 houses, in over 100 of which defective ventilation existed, 67 were reported damp, 40 dirty and 30 without any sanitary accommodation. The majority of the houses have defective traps and flushing arrangements, and in many cases the pipes had no outlets.

It is small wonder that the epidemic is spreading, despite medical skill, and now that the slow going public mind is thoroughly roused to a sense of its danger prompt and thorough measures are sure to be taken to insure better drainage, and no American sanitary appliance manufacturers need have any fear of losing money by establishing a branch in Australia, with stock to draw upon and a capable man in charge.

ASSOCIATIONS.—The Victorian Hardware Assistants' Association held their annual picnic a short time since and had an enjoyable day at Sorrento, on the shores of Port Phillip. Kindred associations are being formed in other parts of the colonies, and it is impossible to overrate the value of these organizations. The Victorian association is in a thoroughly good financial position, though only about six years old, and possesses club room, literary and debating societies, &c. It has a most energetic and popular secretary in the person of A. W. Jones of I. J. Connelly & Co. of South Melbourne.

A Large Order.

THE GRAY & DUDLEY HARDWARE COMPANY of Nashville, Tenn., recently sold Meyer-Neville Hardware Company of Meridian, Miss., a stock of Hardware for cash, amounting to about $50,000. Some months since the latter company were organized to engage in the Hardware jobbing business, with an authorized capital of $100,000, $50,000 paid in. After a thorough investigation they found that owing to the peculiar conditions of the market goods could be bought cheaper from jobbers than from manufacturers. They accordingly decided to place their order with a single jobbing concern, which could fill the order complete and at the most advantageous prices. In competition with jobbing houses of Chicago, St. Louis, Louisville and other cities, the Gray & Dudley Hardware Company secured the order, an achievement of which they are justly proud.

The Meyer-Neville Hardware Company are occupying a store 62 x 140 feet in size, brick, with a stone front. They anticipated beginning business July 10 with a large and complete stock of Hardware adapted to the requirements of the trade in that section.

Requests for Catalogues, &c.

DANIEL IRVIN'S SONS, Bellefonte, Pa., have opened a branch store at Centre Hall, Pa., where they will carry a line of Builders' and general Hardware, Stoves, Paints, Oils, Glass, &c. The firm would be pleased to have the trade send catalogues, price-lists and other matter to that address.

The Hardware Supply Company of Baltimore, Md., were incorporated on June 26, for the purpose of conducting a jobbing and retail Hardware business at 128 South Calvert street, with the following officers: President, W. H. Whiting; vice-president, Jas. Walker; secretary and manager, I. Walter Abbott; treasurer, A. V. Cutino. Mr. Whiting is the senior member of W. H. Whiting & Co., Marine Hardware and Yacht Fittings, with whom Mr. Walker is also connected. Mr. Abbott has been connected with the wholesale house of Henry Keidel & Co. as traveling salesman and was formerly for 32 years with H. W. Webb & Sons. For a short time he was also with Barker-Jennings Hardware Company

of Lynchburg, Va. Mr. Cutino was formerly for 18 years with H. W. Webb & Sons. In entering upon their new career, the firm advise us that they are intending to pursue a conservative and progressive policy and will endeavor to keep in stock a complete asortment of Hardware, Cutlery, Guns, Ammunition, Sporting Goods, &c., and will add from time to time such goods as their trade demands. The company would be pleased to receive catalogues and other matter from manufacturers.

Trade Items.

THE ORNAMENTAL IRON & WIRE COMPANY, Chattanooga, Tenn., manufacturers of Iron and Wire Fencing, Office and Bank Railing, Window Guards, Roof Crestings, Fire Escapes, Iron Stairways, Jail Cell Work, and general builders' Iron Work, advise us that they have many orders booked for this class of work, and are working overtime with increased force to turn out the work promptly. They have recently issued 100-page illustrated catalogue D, with prices, which will be sent to those requesting it.

HON. A. M. WRIGHT, president and general manager of the Connecticut Valley Mfg. Company of Centerbrook, Conn., has been appointed vice-president for the State of Connecticut of the Pan-American Exposition at Buffalo in 1901.

WE are advised by the H. F. Brammer Mfg. Company, Davenport, Iowa, that the fire which recently visited their works did not cause any delay in the filling of their orders. Their stock of the O. K. and O. I. C. Washing Machines is in excellent shape, and they are able to fill all orders promptly.

The Advantages and Disadvantages of Consolidation.

IN the following letter, which is from a prominent and successful manufacturing concern, reference is made to the manner in which consolidation of interests has been effected in their business. The important fact is brought out that this has been accomplished without losing the influence of individual direction, which is so essential an element of success in business. Many instances will occur to those who are informed of the course of things in the trade of the loss which has been suffered by corporations or consolidations in one form or another from the fact that there is the absence of that individual direction which in the separate concerns was in good measure the secret of their success. Our correspondent says:

There are undoubtedly great advantages in the consolidation of different concerns in one line of manufacturing, if properly carried out. Our company are a consolidation under one controlling interest of six different manufacturing concerns. This was not all done at once, but gradually. We had absorbed two of our competitors before we reorganized our company, early in '98. At that time we took in two others, and later, in January, '99, we bought out the largest of our competitors. The saving of expenses in running the one company as compared with the six which were previously in the business, is about $46,000 per year, or slightly more than 10 per cent. of our capital stock. You can easily see that this enables us to sell our goods at perhaps less than the cost would be to each of the six concerns if they were still running separately.

Ours is a really successful (both from the sellers' and buyers' point of view) consolidation, and has been carried out without any stock speculation, and under the full control of one individual. Our idea is that a corporation with one absolutely controlling head is far more likely to be successful than one in which there is no such individual control of the company.

C. H. Sibley and C. L. Trenery of Le Mars, Iowa, have recently formed a partnership under the style of Sibley & Trenery, and will deal in Farm Implements, Buggies and Wagons. The firm of C. L. Trenery & Co. will continue at the old stand as heretofore, as dealers in Hardware, Stoves, &c.

Price-Lists, Circulars, &c.

CONTINENTAL TOOL COMPANY, Frankfort, N. Y.: Shovels, Forks, Hoes and Rakes. A folder illustrates the company's products and gives a view of their factory.

THE J. M. CARPENTER TAP & DIE COMPANY, Pawtucket, R. I.: Tools for cutting screw threads. Catalogue No. 13, just issued, illustrates, with prices, Taps, Dies, Screw Plates, Die Stocks, Tap Wrenches, &c.

STEWARD & ROMAINE MFG. COMPANY, Philadelphia, Pa.: Expansion Bolts. An illustrated catalogue and price-list for 1900 includes Iron and Brass Expansion Bolts, suitable for a large range of uses.

ATLAS BOLT & SCREW COMPANY, Cleveland, Ohio: Bolts, Machine Screws, Rivets, &c. The company's 1900 catalogue contains illustrations and prices of their varied line of goods. The book is indexed for ready reference to any particular line.

HOLROYD & Co., Waterford, N. Y.: Stocks and Dies. A 1900 illustrated catalogue and price-list is devoted to Stocks and Dies, Round Adjustable Die Plates, Taps, Dies and Threading Tools. The Fairbanks Company, 16 Great Eastern street, London, England, are the manufacturers' European agents.

POWERS & WILLIAMS, Streator, Ill.: Special illustrated Skylight price-list.

SUPERIOR TACK & NAIL COMPANY, Penn Yan, N. Y.: Revised price-list of Tacks, Clout, Trunk and Basket Nails, Wire Nails and Brads, Cigar Box Nails, Double Pointed Tacks, Staples, &c.

ROGERS SCREW COMPANY, Providence, R. I.: List on Improved Steel Wood Screws, with net prices figured at different discounts.

Among the Hardware Trade.

A. B. Bachelor & Son have disposed of their Hardware, Stove and Agricultural Implement business, at Belleville, Kan., to Schaefer & Mosher.

The business heretofore conducted by Charles E. Adams at Lowell, Mass., has been purchased by the Adams Hardware & Paint Company, incorporated. The officers of the new company are Charles E. Adams, president, and Franklin E. Johnson, treasurer. Arthur T. Munn will manage the Hardware department and Frank M. Short the Paint department.

Frank L. Donlevy has associated with him in his Hardware business at 833 Arch street, Philadelphia, Pa., Augustus B. Kern, and the style of the firm is now Donlevy & Kern.

The Victor Mines Supply & Hardware Company, Victor, Col., are making improvements in their store, including an installment of Warren Cabinet Shelving. J. A. Nelson & Co., Round Rock, Texas, have also placed an order with the J. D. Warren Mfg. Company of Chicago for Warren Shelving. The company have also booked an order from P. Merex of Tilburg, Netherlands.

William Kerridge, Hancock, Mich., has made extensive improvements in his establishment, making it more attractive and convenient than heretofore. Mr. Kerridge does a wholesale and retail business in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., and also Furniture.

Swenning, Gregg & Co., who have been conducting the Hardware business at Panama, Iowa, since the fall of 1882, have sold out and retired.

E. F. Freeman, Osceola, Iowa, has disposed of his stock of Hardware, Stoves, Farm Implements, &c., to J R. White, who will continue at the old stand.

Mayo & Co. have succeeded Mayo, Fry & Co., Sallisaw, I. T., dealers in Hardware, Stoves, Farm Implements, Sporting Goods, &c.

Schaefer & Mosher have purchased the hardware stock of A. B. Bachelor & Son, at Belleville, Kan., and also that formerly owned by Charles F. Taylor, at Oskaloosa. The latter stock will be removed from Oskaloosa and consolidated with the Bachelor stock at Belleville, where the firm will conduct a retail business in shelf and heavy hardware, stoves and tinware, sporting goods, agricultural implements, &c.

The Wire Goods Company.

THE WIRE GOODS COMPANY, Worcester, Mass., have recently acquired and taken over the entire business of the American Wire Goods Company, Lowell, Mass. The Lowell concern have been competitors, to some extent, of the Worcester concern, and this purchase by the latter company will tend to give them even greater prominence than they now hold in the Wire Goods market. There has been some difficulty and delay in obtaining the popular numbers of Wire Coat and Hat Hooks that have always been made by the Lowell concern, but we are assured that the company will hereafter hold themselves in readiness to supply these goods in any quantity desired.

Miscellaneous Notes.

Juniata Horse and Mule Shoes.

A catalogue devoted to Juniata horse and mule shoes, manufactured by the American Steel & Wire Company, at the Shoenberger Mill, Pittsburgh, Pa., contains a list of shoes with information as to whether they are made of iron or steel. The company formerly filled orders for steel shoes on any of the patterns in their catalogues, if steel was specified. Now extra light, light and medium shoes, and also mule shoes, are made in either iron or steel. Information is also given as to other patterns which are made, some in iron and some in steel.

Store Fixtures.

The Bloomington Store Fixture Company of Bloomington, Ill., issue a large sheet illustrating hardware store shelving, counters, floor showcases, &c., of different styles. The illustrations are referred to as containing practical suggestions which can be adapted to any stock or building. If the illustrations do not fully meet the requirement of prospective purchasers the company state that they will make plans, without charge, to suit individual stores. The company advise us that they have fitted up some very fine hardware stores and a large number of smaller ones with ordinary fixtures, but that in most cases they design special fixtures to meet the views and requirements of their patrons.

Lawson Mfg. Company.

The Lawson Mfg. Company, whose Matchless pivot hanger was illustrated and described in our issue of July 5, 1900, have their main office and works at Milwaukee, Wis., with branch offices 115 Lake street, Chicago, and 107 Chambers street, New York. The location of their main office and works was inadvertently omitted in the description of the hanger.

Thompson's Combination Jack and Wrench.

The accompanying cuts illustrate a combination jack and wrench, offered by Chas. E. Thompson, Leesburg, Va. The device is made of malleable iron, 22 inches in length over all, as shown in Fig. 1. The wrench consists of a receptacle for the axle nut, seen on the upper side of Fig. 1. The jack is used as a lever to



Fig 1.—*Thompson's Combination Jack and Wrench.*

start the nut only, when the wrench is pushed forward and the nut is turned off, as shown in Fig. 2. The jack is then passed between the spokes, resting it on the axle with the hook catching under the axle, as in Fig. 3. The jack is lifted with the right hand, and the wheel pulled off the spindle with the left, as in Fig. 3, when the outer end of the jack is rested on the hub, thus making a support, as in Fig. 4. When replacing the nut, the operation is the reverse of unscrewing it. The parts of the jack which come in contact with paint are protected by leather. The manufacturer calls attention to the following points of excellence: That the jack does the work in half the time required with one of the old style; that the wrench is adjustable to any nut; that it holds the nut while greasing and prevents the washer

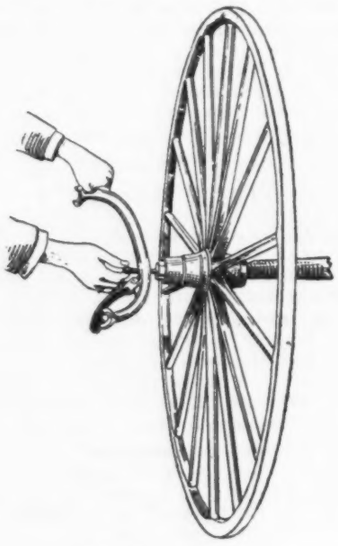


Fig. 2.—*Turning off Nut*

falling; that it holds the wheel while greasing, after which it can be quickly replaced, being near at hand;

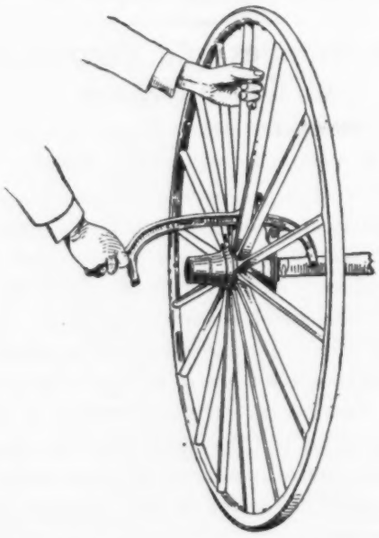


Fig. 3.—*Catching Hook Under Axle.*

that the whole operation is performed without changing position or adjustment; that there is no chance of the

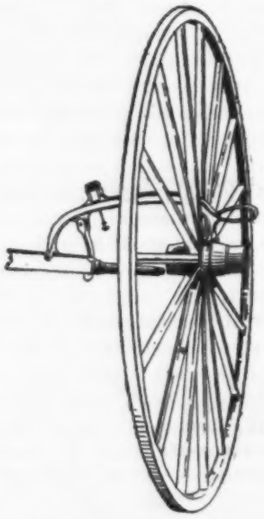
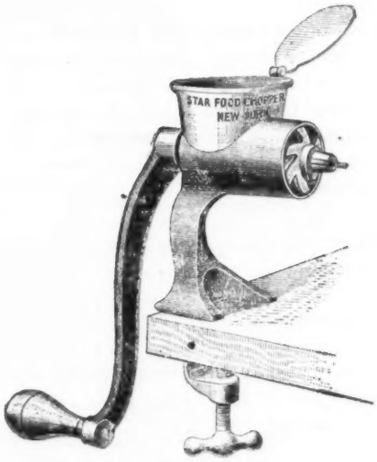


Fig. 4.—*Supporting Axle.*

operator rubbing against the wheel and soiling clothes; that no grease can reach the hands, and that the jack leaves the spindle free, in order to put on the washer.

Star Food Cutter.

Charles D. Brown, 160 Duane street, New York, is offering the Star food cutter here illustrated. It is intended for cutting meat, fish, poultry, vegetables, fruit, cheese and other aliments of a similar character. It is made in family size, No. 1, and a larger size, No. 3, for restaurants, boarding houses, hotels, &c. The manufacturer emphasizes the fact that it will chop, without mashing or crushing, either coarse, medium or fine particles according to the knife used at the end of the shell, there being three knives sent with each cutter, one with three cutting teeth, another with eight and one with 12 for fine work. Another feature is the outward curve to the standard, which permits a dish to be placed further under the machine so that all the material falls into the plate or dish instead of outside. There is 3⅛ inches clear between the bottom of the machine and top of the table or shelf. To the top of the

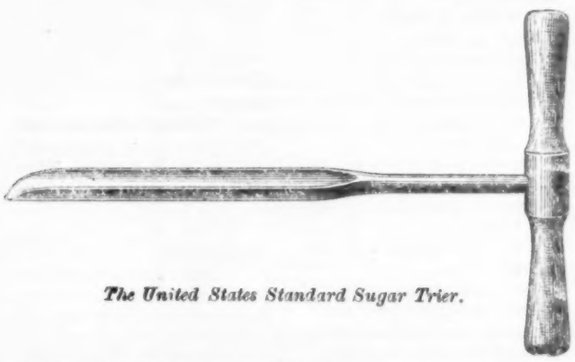


Star Food Cutter.

hopper is hinged a plate with handle by means of which the material to be cut is forced upon the feed screw, without soiling or injuring the fingers, so that every particle can be cut, the plate entering well within the hopper. The standard, barrel and hopper are of one piece of metal, and all the parts are tinned. A few revolutions of the wing nut on the end releases the knife and feed screw so the screw can be withdrawn without detaching the handle for cleaning.

The United States Standard Sugar Trier.

The accompanying cut represents a sugar trier put on the market by Hunt & Dewes, 180-182 Centre street, New York for sampling raw sugars imported in bags. The Government has furnished its sugar samplers at this port with triers, renewing them from time to time, as necessity required, each supply being different from the ones preceding it. Upon comparison it was found that six kinds were in use, and that each trier had an

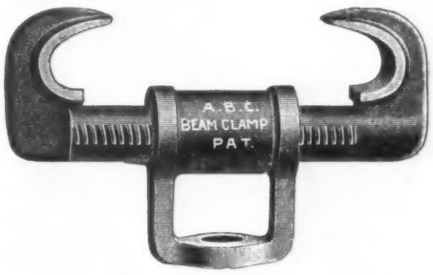


The United States Standard Sugar Trier.

individuality of its own, so that when it became necessary to have each trier draw the same quantity of sugar it was found to be impossible to obtain the desired uniformity. At the direction of Hon. W. F. Wakeman, Appraiser of the Port, Theodore Near, of the Sugar Division, made a model based upon scientific principles, as a guide for the manufacturers. The triers are referred to as being made of the best steel, drop forged, all exactly alike, finished and polished to a high degree. The handle is formed so as to give a grip which will not cramp, blister or lacerate the hand of the operator. The trier, it is stated, overcomes all defects and objections of the triers formerly in use, giving satisfaction to the sampling force at this port, and it is believed that the Treasury Department will generally adopt it.

A. B. C. Beam Clamp.

The accompanying cut shows the A. B. C. beam clamp, for use in connection with a pipe hanger. This is a new article manufactured by the Illinois Malleable Iron Company, 30-32 West Monroe street, Chicago. This device is made of malleable iron and is recommended



A. B. C Beam Clamp

by the makers on account of its strength and simplicity. The hooks are held together by the sleeve part of the middle piece, and the hanger supporting the line of pipe is suspended by means of a rod and nuts. The sleeve when turned into a quarter turn allows the clamp to be adjusted and is then locked by turning it back to its original position; the teeth on the hooks engaging in corresponding slots on inside of sleeve. The hooks are sharpened where they extend over the flange of the beam so that they can be driven under the brick. The A. B. C. clamp will fit beam flanges of any width from 3 to 7 inches. They are made in three sizes to take rods made of pipe, No. 1 of ¼-inch, No. 2 of ⅜-inch and No. 3 of ½-inch pipe.

The Hiles Ice Breaker.

The ice breaker for family use shown herewith is being placed on the market by C. A. Hiles & Co., 336 and 338 Carroll avenue, Chicago. The breaker consists of two parts, a cast iron grate and a sheet steel band. The center portion of the grate is a network of cross bars with 1-inch square spaces, the cross bars being about 3-16 x ¾ inch thick and at each point of intersection 1 inch. The intersecting portions of the bars are pointed and project above the rest of the surface of the bars, which are also beveled on their upper edges. This center part is inclosed by a ring, the under side of which is grooved, ample space being left, it is pointed out, to fit



The Hiles Ice Breaker.

the various sizes of wooden pails in common use. The grate is galvanized and weighs 7½ pounds. The band is heavy and made of No. 20 sheet and galvanized after shearing. It extends fully 3 inches above the surface of the grate, to which it is riveted.

The maul is 3 inches in diameter, made of hickory and shellacked. In use the ice is placed in the breaker and is broken with the maul; the small pieces when broken falling through into the bucket. A coarse cloth thrown over the ice before striking it with the maul will prevent it from scattering. The ice is broken into pieces ¾-inch and less, which is referred to as the best size for small ice cream freezers and general household use. It is stated that the operation is quite rapid, an entire cake of ice being broken in a very few minutes.

Spiral Wire Tubes.

Poindexter & Hamilton, Cynthiana, Ky., are offering the spiral wire tubes for grain drills herewith illustrated. These are being introduced to the trade in New York, Pennsylvania, Ohio and Michigan by the Lockwood-Taylor Hardware Company of Cleveland, Ohio, for which States they are the general sales agents. The drill can be attached, it is explained, to the receiver on any drill that uses rubber tubes. It is large enough, it is shown, to fit the largest receivers, and can be made to fit smaller ones by cutting off one or more coils and then screwing it on. The regular size of the tube is 1⅞ inches at the

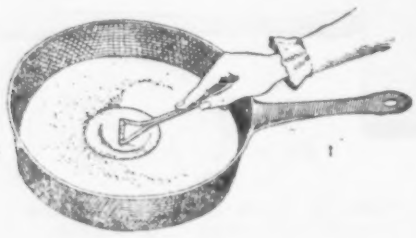


Spiral Wire Tubes for Grain Drills.

flared end and ¾-inch at the small end, inside diameter, and 21 inches in length. The tubes can be furnished, however, in any size wanted. An expert test was made with the tubes by a drill company, which, it is stated, proved entirely satisfactory. The following advantages are referred to by the manufacturers: That the tube is indestructible, lasting as long as the drill; that it will not kink or buckle; that it will not choke and cause the driver trouble; that it is a force feed tube, as there is always a continuous vibration; that fertilizer can be used to perfection; that the tube will not become displaced by corn stalks or other minor obstacles; that it distributes grain perfectly even; that grain continues to flow regularly while the tube is bent by any movement of the drill, hoes or other obstacles and that when the drill is started, the tubes are always in perfect shape.

Lightning Dish and Kettle Cleaner.

The Lightning Dish & Kettle Cleaner Company, 305 Nicollet avenue, Minneapolis, Minn., are offering the cleaner shown herewith. It consists of two parts, a handle of coppered steel wire nickeled and a spherical disk of steel, out of which is drawn a hinge into which



Lightning Dish and Kettle Cleaner.

the handle is sprung. By its shape and the manner in which it is attached to the handle, it readily conforms, it is explained, to any dish. It is remarked that the cleaner can be used to advantage as a stirrer, as it has six inches of bearing surface, and can be worked backward as well as forward, doing the work of more than a dozen spoons. The cleaner can also be used, it is pointed out, to shave ice, clean foreign substances from window glass, iron, brass or any metal and to polish wooden bowls, trays, kneading boards, tables or counters. A little extra effort, it is stated, will remove worn varnish and paint, leaving the surface smooth and polished.

CONTENTS.

	Page.
The Hilles & Jones Horizontal Punches. Illustrated	1
The Minette District of Lorraine, Luxemburg and France.—III	2
Pacific Coast Trade Prospects	5
The Defiance Wood Dish Machine. Illustrated	5
The American Bridge Company	6
The Langelier Wire Straightening and Cutting Off Machine. Illus.	7
The Vincennes Machinery Exhibit	8
The Convenience of Lifting Magnets Illustrated. Illustrated	10
The N. O. Nelson Interests at Edwardsville, Ill.	11
Naval and Merchant Ship Construction	12
Australasian News	13
The Barnes Motor Driven Upright Drill. Illustrated	13
A Modern English Blast Furnace. Illustrated	14
Canadian News	16
Industrial Notes from Chester, Pa	16
The Robinson Geared Power Brake. Illustrated	17
Lake Iron Ore Matters	18
The International Congress at Paris	19
Editorials:	
Agreements on Prices	21
Monetary Principles	21
Obituary	22
The Sheet Mill Scale Settled	22
Pig Iron Production Sharply Declining	23
German Importation of Duty Free Shipbuilding Material	24
Personal	24
Central Pennsylvania News	25
Manufacturing:	
Iron and Steel	25
Machinery	25
Hardware	26
Miscellaneous	26
A Novelty in Steel Making	26
The Iron and Metal Trades:	
A Comparison of Prices	27
Chicago	27
Philadelphia	28
Cleveland	29
Cincinnati	30
St. Louis	30
Pittsburgh	31
Birmingham	32
The British Iron Market	32
New York	33
Metal Market	34
The Cleveland Molders' Strike	34
A New Lead and Zinc District	34
Information Wanted	34
Iron and Industrial Stocks	35
The New York Machinery Market	35
Bids on Government Contracts	36
Hardware:	
Condition of Trade	37
Notes on Prices	37
Hardware Organizations:	
Pacific Coast Hardware and Metal Association	39
Texas Hardware Jobbers' Association	39
San Francisco and Oakland Retail Hardware Dealers' Association	39
Letters from Hardware Manufacturers on the Business Situation	40
From an Australian Correspondent	48
A Large Order	48
Requests for Catalogues, &c	48
Trade Items	49
The Advantages and Disadvantages of Consolidation	49
Price-Lists, Circulars, &c	49
Among the Hardware Trade	49
The Wire Goods Company	50
Miscellaneous Notes:	
Juniata Horse and Mule Shoes	50
Store Fixtures	50
Lawson Mfg. Company	50
Thompson's Combination Jack and Wrench. Illustrated	50
Star Food Cutter. Illustrated	51
The United States Standard Sugar Trier. Illustrated	51
A. B. C. Beam Clamp. Illustrated	51
The Hiles Ice Breaker. Illustrated	51
Spiral Wire Tubes. Illustrated	52
Lightning Dish and Kettle Cleaner. Illustrated	52
Current Hardware Prices	53
Current Metal Prices	60

Current Hardware Prices.

REVISED JULY 10, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—
Domestic, ₱ doz. $3.00....33⅓@33⅓&10%
North's....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—
Ives' Patent....25&5%
Taplin's Perfection....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils....₱ lb 7¼@7¾c
Hay-Budden, Wrought....8@9¼c
Horseshoe brand, Wrought. 9¼@9¾c
Samson....₱ lb 7¾@8c
Trenton, Wrought....₱ lb 8¼@8¾c

Imported—
Armitage's Mouse Hole....8¾@9¼c
Peter Wright's....9¼@9¾c

Anvil, Vise and Drill—
Millers Falls Co., $18.00....20%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—
Common Double Spur..60&10&10@70%
Boring Machine Augers....60&10&10@70%
Car Bits, 12-in. twist....60@..%
Jennings' Pattern:
Auger Bits....60@..%
Ford's Auger and Car Bits..40&10@40&10&10%
Forstner Pat. Auger Bits....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40@40&10%
No. 30. R. Jennings' List..50&10@60%
Russell Jennings'....25&10&2½%
L'Hommedieu Car Bits 15&10@15&10&5%
Pugh's Black....20%
Pugh's Jennings' Pattern....35%
Snell's Auger Bits....60%
Snell's Bell Hangers' Bits....50%
Snell's Car Bits, 12-in twist....60%
Wright's Jennings Bits (R. Jennings' list)....50%

Bit Stock Drills—
Standard List....65@65&5%

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Lavigne's Clark's Pattern, No. 1, ₱ doz., $26; No. 2, $18....50&10%
Steer's No. 1, $26; No. 2, $18...40@40&5%
Swan's....60%

Gimlet Bits—
Common Double Cut..gro. $2.75@3.25
German Pattern....gro. $5.00@5.50
Double Cut, makers' lists....50&5@50&10%

Hollow Augers—
Ames....25&10%
Bonney's Adjustable, ₱ doz....$16.00
New Patent....25&10%
Universal....20%

Ship Augers and Bits—
Ford's....40%
Snell's....40%
L'Hommedieu's....15&10@15&10&10%
Watrous'....40@40&5%

Awl Hafts, See *Hafts, Awl.*

Awls—
Brad Awls:
Handled....gro. $2.75@3.10
Unhandled, Shouldered gro. 63@66c
Unhandled, Patent....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered. gro. 65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@13.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes
First Quality, best brands, $6.25@6.50
First Quality, other brands $6.00@6.25
Jobbers' Special Brands:
Good Quality....$5.00@5.50
Best Quality....$6.25
Cheap, Handled Axes....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—

	Iron.	Steel.	
Concord, loose collar	6¼c	6 c	2% cash 10 days.
Concord, solid collar	6¾c	6½c	
No. 1 Common	5 c	4¾c	
No. 1¼ Com. New Style	5½c	5¼c	
No. 2. Solid Collar	5¾c	5½c	
Nos. 7, 8, 11 to 14		50&10%	
Nos. 7, 8, 11 to 14, 100 sets		60%	
Nos. 15 to 18		50%	
Nos. 19 to 22		60&10%	

Boxes, Axle—
Common and Concord, not turned..lb. 5c
Common and Concord, turned..lb. 6c
Half Patent....lb. 9c

Balances—
Sash—
Caldwell new list....50%
Pullman's....62½%
Spring—
Spring Balances....50@50&5%
Chatillon's Light Spg. Balances...40&10%
Chatillon Straight Balances....40%
Chatillon Circular Balances....50%
Chatillon's Large Dial....30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb., per lb... 3½@3¾c

Beams, Scale—
Scale Beams, List Jan. 12, '82....30@30&5%
Chattillon's No. 1....30%
Chattillon's No. 2....40%

Beaters—Egg—
Standard Co.:
No. 5 Steel Handle Dover, ₱ gro. $6.50
No. 10 Cast Handle Dover, ₱ gro. $8.00
No. 10 Steel Handle Dover, ₱ gro $8.00
No. 15 Extra Heavy Steel Handle, ₱ gro. $15.00
Rival, ₱ gro....$14.00
Taplin Mfg. Co.:
₱ gro.
No. 50 Small Family size....$6.50
No. 100 Regular Family size....$8.00
No. 103 Regular Family size, tinned....$9.50
No. 150 Large Family size....$10.00
No. 152 Large Family size, tinned....$17.00
Lyon's, Standard size....₱ doz. $1.75
Wonder (S. S. & Co.)....₱ gro. $7.50

Bellows—
Blacksmith—
Standard List....70@70&5%

Net Prices.	Inch..	30	32	34	36	38	40
	Each..	*$3.70*	*3.95*	*4.55*	*5.10*	*5.70*	*6.55*
	Extra Length:						
	Each..	*$4.25*	*4.85*	*5.40*	*5.95*	*6.80*	*7.95*

Molders—

Net Prices.	Inch..	9	10	11	12	14	16
	Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Net Prices.	Inch...	6	7	8	9	10	12
	Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.75*	*6.75*

Bells—Cow—
Ordinary goods....75&10%
High grade....70@70&10%
Jersey....75@75&10%
Texas Star....50&10%

Door—
Barton Gong....55%
Gong, Yankee....55%
Monroe, R. & E. Mfg. Co.'s....50&10%
Lever and Pull, Sargent's....33⅓&10%
Hand-
Hand Bells, Polished....65@65&10%
White Metal....65@65&10%
Nickel Plated....50@50&10%
Swiss....60@60&10%

Miscellaneous—
Farm Bells....lb 1@1½c
Steel Alloy Church and School....50&10&5@60%
Wilmot & Hobbs Mfg. Co, Gongs....70%

Belting
Rubber—
Common Standard....70&10@75%
Standard....60&10@70%
Extra....60@60&10%
High Grade....60@60&10%
Leather—
Extra Heavy, Short Lap....50&10@50&10&5%
Regular Short Lap....60@60&10%
Standard....60&10@60&10&5%
Light Standard....70%
Cotton—
Rossendale-Reddaway B. & H. Co.:
Sphinx Brand....60&10%
Durable Brand....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Green River Tire Benders and Upsetters....20%
Ill. Iron & Bolt Co....40@40&5%
Stoddard's Lightning Tire Upsetters....40@50%

Bicycle Goods—
Lane's Cycle Hanger....33⅓&5%
John S. Leng's Son's 1899 list:
Chain....50%
Parts....50%
Spokes....50%
Tubes....60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—
Common Wooden....70@70&10%
Cleve and Steel....50&10@60&10%
Eddy's Steel....60&10%
Hartz Steel....50&10%
Ford's Star Brand Self Lubricating....60&10%
Hollow Steel, Ford's Pat. Star Brand....50&10%
Lane's Patent Automatic Lock and Junior....30%
Stowell's Novelty, Mal. Iron....50%
See also *Machines, Hoisting.*

Boards, Stove—
Zinc, Crystal, &c....50&10%

Bolts—
Carriage, Machine &c.—
Common, list Jan. 30, '95, 60&10&10@..%
Norway Iron, $3.00, list Oct. 7, '84....75@75&10%
Phila. Eagle, $3.00 list May 24, '99..80%
Bolt Ends, list Jan. 30, '95..70&10@..%
Machine, list Oct. 1, '99....70&10@..%
NOTE.—*Jobbers' prices on Bolts are now generally lower than manufacturers', and the market is irregular.*

Door and Shutter—
Cast Iron Barrel, Round Brass Knob:

Inch....	3	4	5	6	8
Per doz...	*$0.33*	*.36*	*.45*	*.57*	*.80*

Cast Iron Spring Foot:

Inch....	6	8	10
Per doz....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch....	6	8	10
Per doz....	*$0.35*	*1.20*	*1.50*

Cast Iron Shutter, Brass Knobs:

Inch....	6	8	10
Per doz....	*$0.60*	*.90*	*1.15*

Wrought Barrel Brass Knob:

Inch....	3	4	5	6	8
Per doz..	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel....70&10@75&5%
Wrought " Bronzed..50&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck....50@50&10%
Wrought Sunk....50@50&10%
Ives' Patent Door....62½@62½&10%

Stove and Plow—
Plow....50&10@60%
Stove....60@60&10

Tire—
Common....60@60&10%
American Screw Company:
Norway Phila., list Oct. 16, '84....70%
Eagle Phila., list Oct. 16, '84....72½%
Bay State, list Dec. 28, '99....57%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84....70%
Eagle Phila., list Oct. 16, '84....72½%
Eclipse, list Dec. 28, '99....57%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99....57%
Keystone Phila., list Oct. '84....72½%
Norway Phila., list Oct. '84....70%

Borers, Tap—
Borers Tap, Ring, with Handle:

Inch....	*1¼*	*1½*	*1¾*	*2*
Per doz..	*$3.50*	*4.50*	*5.00*	*6.50*
Inch....		*2¼*		*2½*
Per Doz....		*$7.50*		*10.25*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each....25@30%

Boring Machines—*See Machines, Boring.*

Boxes, Mitre—
Seavey's, per doz, $30....40%

Braces—
NOTE.—*Most Braces are sold at net prices.*
Common Ball, American..$1.10@1.20
Barber's....50&10&10@60&10%
Fray's Genuine Spofford's....50&10&5%
Fray's No. 70 to 120, 81 to 123, 207 to 414....50&10&5%
P., S. & W. Co., Peck's Patent....50&10@60%

Brackets—
Cast Iron, plain....60&10@70&10%
Wrought Steel....70&5@70&10%
Bradley's Wire Shelf:
Full cases....80&10%
Broken cases....80%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—
Wire Goods Co....70@70&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—
Hoosier....₱ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—
Wrought list Sept., '96....25&10@35%
Cast Brass, Tiebout's....50%

Cast Iron—
Fast Joint, Broad....50@....%
Fast Joint, Narrow....50@....%
Loose Joint....66⅔&5@70%
Loose Pin....66⅔&5@70%
Mayer's Hinges....66⅔&5@70%
Parliament Butts....66⅔&5@70%
NOTE.—*Jobbers often undersell manufacturers.*

Wrought Steel—
Loose Joint....
Table and Back Flaps..
Narrow and Broad....
Inside Blind.... 70&5@70
Loose Pin.... &10&5%
Loose Pin, Ball and Steeple Tip....
Bronzed Wrt. Nar. and Inside Blind Butts....50&10@50&10&5%

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series....5%
1200 series....33⅓%
200, 300, 600 and 900 series....40&10%
Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt....per lb. 4@4¼c
Sharp....per lb. 4½@4¾c
Perkins' Blunt....₱ lb 4 c
Perkins' Sharp....₱ lb 4½c

Can Openers—See *Openers, Can*

Cans, Milk—

Buffalo Pattern:	5	8	10 gal.	
		$3.60	$4.00..	33⅓%
Illinois Pattern.	$2 40	3.10	3.50..	33⅓%
Iowa Pattern...	2.40	3.95	3.75..	33⅓%
	20	30	40	qts
New York Patt'rn	3.00	4.35	4.60..	33⅓%
Baltimore Patt'rn	3.10	4.45	4.70..	33⅓%

Cans, Oil—
Galvanized Blue Band, 1-gal., ₱ doz. $1.75@$2.00
S. S. & Co., Galvanized Family with faucet, 3-gal., ₱ gro. $54; 5-gal. $63; 10-gal., $120.00
Glass Oil....₱ doz. $1.90@$2.20

Caps—Percussion—
Eley's E. B....50c
G. D....per M 32@34c
F. L....per M 37@40c
G E....per M 47@50c
Musket....per M 57@60c

Primers—
Berdan Primers, $1.00....5%

B. L. Caps (Sturtevant Shells)
$1.00 .....5%
All other primers.....*$1.10@$1.12*

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
B. B. Caps, Con., Ball Swgd. ...*$1.90*
B. B Caps, Round Ball...*$1.12@1.18*
Blank Cartridges:
32 C F., $5 50.....10c&5%
38 C. F., $7 00.....10c&5%
22 cal. Rim, $1.50.....10c&5%
32 cal. Rim, $2.75.....10c&5%
Central Fire.....25%
Pistol and Rifle.....15c&5%
Primed Shells and Bullets.....15c&5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15&5%

Casters—
Red.....60c&10c&10@70%
Plate.....60c&10@60c&10c&5%
Philadelphia.....70c&10@70c&10c&10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Payson's Anti-friction Furniture.70&10%
Payson's Anti-Friction Truck....70&10%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....80%

Cattle Leaders—
See *Leaders, Cattle.*

Chain—
American Coil, Full Casks:

3-16	¼	5-16	⅜	7-16	½	9-16
7.90	6.00	5.00	4.15	4.00	3.90	4.40

⅝	¾	⅞	1 inch.
3.70	3.65	3.55	3.55 cents per lb.

Less than Cask lots add 10c per 100lbs.
German Coil, list July 24, '97.....60&10c&10%
German Halter Chain, list July 24, '97.....60&10c&10%
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...*$26.00*
6½—6-2, Straight, with ring..*$27.00*
6½—8-2. Straight, with ring..*$31.00*
6½—10-2, Straight, with ring..*$35.00*
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains, list April, '98.....50c&10@60%
Jack Chain, list July 10, '93:
Iron.....60@60c&10%
Brass.....60@60c&5%
Gal. Pump Chain.....*lb* 5@5½c
Breast, Hitching and Rein Chains.
Covert Sad. Works.....50%
Covert Mfg. Co.:
Breast.....35&2%
Halter.....35&2%
Heel.....35&2%
Rein.....35&2%
Stallion.....35&2%
Oneida Community:
Eureka Coil and Halter.....60@60&5%
Niagara Coil and Halter.....60@60&5%
Niagara Cow Ties.....45&5@45&10&5%
Am. Coil and Halters....50&10&5@60%
Am Cow Ties.....35&5@40&5%
Wire Goods Co.:
Dog Chain.....60%
Universal Dbl-Jointed Chain.....45%

Chalk—(From Jobbers.)
Carpenters', Blue.....*gro. 45c*
Carpenters', Red.....*gro. 35c*
Carpenters', White.....*gro. 30c*
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60@60&10%

Chisels—
Socket Framing and Firmer
Standard List.....70&5@.....%
Buck Bros.....30%
Charles Buck.....30%
Swan's.....70&5%
L. & I. J. White.....30@30&5%

Tanged—
Tanged Firmers.....40&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
L. & I. J. White, Tanged.....25&5%

Cold—
Cold Chisels, good quality.lb. 14@16c
Cold Chisels, fair quality.....*lb. 12c*
Cold Chisels, ordinary.....*lb. 8@9c*

Chucks—
Beach Pat., each $8.00.....20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard 30%
Drill Chucks, New Model..... 2 %
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Adjustable, Stearns'.....30%
Cabinet, Sargent's.....45&10%
Carriage Makers', P., S. & W. Co..40&10%
Carriage Makers', Sargent's.....50&10%
Beaty, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Walk—
Star Socket, All Steel....₩ doz. $4.00 net
Star Shank, All Steel....₩ doz. $3.75 net

Cleavers, Butchers'—
Foster Bros.....80%
New Haven Edge Tool Co.'s...40@40&5%
Nichols Bros., Flat hdl., 30%; Rd. hdl., 40%
Fayette R. Plumb.....25%
P., S. & W.....33⅓&5@33⅓&10%
& I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet.....₩ doz. $7.20
Mascotte Toilet.....₩ doz. $8.40
Monitor Toilet.....₩ doz. $9.00
Stewart's Patent.....₩ doz. $10.00

Clips, Axle—
Eagle and Superior ¼ and 5-16 inch.....65c&10@70%
Norway, ¼ and 5-16 inch...65@65c&5%

Cloth and Netting, Wire
—*See Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.)......70c&5@70c&10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope & Stevens' list30&10%
Leather Pope & Stevens' list.....40%

Compasses, Dividers, &c.
Ordinary Goods.....70c&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....25&10%

Conductor Pipe, Galvanized—

	Carload.	L. C. L.
Territory.	*Loose.*	*Nested.*
Eastern....	60c&25c&5%	60c&20c&2½%
Central....	60c&25c&2½%	60c&17½%
Southern..	60c&20c&5%	60c&15%
S. Western.	60c&20%	60c&12½%

Terms, 2% for cash.
See also *Eave Trough.*

Coolers, Water—
S. S. & Co.: 2-gal., $14.00; 3-gal., $16.00; 4-gal., $18.50; 6 gal., $23.00

Coopers' Tools—
See *Tools, Coopers'.*

Cord—Sash—
Braided, Drab.....*lb. 22@25c*
Braided, White, Common, ..*lb16@18c*
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....*lb* 8½@9½c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....*lb. 12 @13c*
Cable Laid Russia.....*lb.* 13½@14c
India Hemp, Braided.....*lb* 14@15c
India Hemp.....*lb.* 10@12c
Patent India.....*lb.*10@12c
Pearl Braided, cotton.....₩ lb 16@18¢
Massachusetts, White.....₩ lb 22½¢
Massachusetts, Drab.....₩ lb 26½¢
Eddystone Braided Cotton.....₩ lb 19¢
Harmony Cable Laid Italian.....₩ lb 18¢
Ossawan Mills:
Crown, Solid Braided White...₩ lb 18¢
Braided, Giant, White.....₩ lb 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson:
Braided, Drab Cotton.....₩ lb 32½¢
Braided, Italian Hemp.....₩ lb 32½¢
Braided, Linen.....₩ lb 49¢
Braided, White Cotton, Spot.₩ lb 28½¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Picture—
Braided or Twisted.....*80@..%*

Corn Knives and Cutters
—See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant.....₩ gr. $24.00
Turner & Seymour Mfg. Co.....50%

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross...*5@6c*
Cases, 100 gro., $4.50 & $5.00, at factory.
D. M. Stewart Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 30%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₩ doz. $7.00
Fort Madison, Light.....₩ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....₩ doz. $10.00

Cutters—Glass—
Smith & Heminway Co.....80%

Meat—

	1	2	3	4	5
American					30%
Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50 $60
Connecticut:					
Nos.	0	1	8	10	12
Each	$1.75	2.25	3.00	3.00	3.50

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, ₩ doz.....33⅓&10%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Hale's, ₩ doz.....60&10&10@70%

Nos.	11	12	13
	$27.00	$38.00	$45.00

Home No. 1, ₩ doz. $26.00.....60%
Little Giant, ₩ doz.....33⅓@33⅓&5%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$75.00	$68.00

Sterling.....33⅓&5%

Nos.		1	2
Each		$2.00	$2.50

Miles' Challenge, ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₩ doz. $24.00..33⅓&5%
Woodruff's, ₩ doz.....40%

Nos.	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₩ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Cabbage Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9..55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₩ gr....$18@$20
Slaw Cutters, 2 Knife, ₩ gr....$22@$36

Tobacco—
All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25@30%
National, ₩ doz. $21.00.....40%
Sargent's, ₩ doz. $24.00.....60@60&10%

Washer—
Appleton's, ₩ doz. $16.00.....60&10@60&10&10%
Bonney's.....₩ doz. $4.75

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz. $10.00
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger...₩ doz. $9.00
Kohler's Universal.....₩ doz. $14.00
Kohler's Little Giant.....₩ doz. $15.00
Kohler's Hercules.....₩ doz. $12.00
Kohler's Invincible.....₩ doz. $10.00
Kohler's Rival.....₩ doz. $9.00
Kohler's Pioneer.....₩ doz. $9.00
Never-Break Post Hole Diggers, ₩ doz. $24.00.....60%
Samson, ₩ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₩ doz. $18; No. 2, $15; No. 3, $14; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.75@$2.00
Blacksmiths' Self-feeding.....*each $3.75@4.00*
Bench Drills, Stearns'.....50%
Breast, Millers Falls, each $3.00..15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Ratchet, Curtis & Curt's.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W...40&10%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓&5%

Twist Drills—
Standard List.....*60@60c&10%*

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Balsey's Screw Holder and Driver, ₩ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27½%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet.....35%
Goodell's Automatic 50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1,50,55 and 60.50&10@50&10&10%
Nos. 20 and 40.....60@60@60&10%
Screw Driver Bits.....₩ doz. 50@70¢
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10%
No. 86.....70&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*Carload.*	*L. C. L.*
Eastern..	75c&15%	75c&10%
Central..	75&12½%	75c&7½%
Southern..	75c&10%	75c&5%
S. Western..	75c&2½%	75%

Terms, 2% for cash.
See also *Conductor Pipe.*

Egg Beaters—See *Beaters, Egg.*

Egg Openers—
See *Openers, Egg.*

Emery, Turkish—

	4 to 16	54 to 150	Flour
Kegs.....*lb.*	4½c	5 c	5 c
½ Kegs....*lb.*	4¼c	5¼c	5¼c
¼ Kegs....*lb.*	5 c	5½c	5½c
10-lb cans, 10 in case.....	6 c	6½c	5½c
10-lb.cans,less than 10.....*10*	c	10 c	8 c

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70c&5@70c&10c&5%
Metallic Key, Leather Lined.....70@70 &10
Red Cedar.....50@50c&5
B. & L. B. Co.:
West's Lock, Open and Shut Key50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined. 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar....40%
Star.....60@60&5%
Star, Metal Plug new list.....40@40&5%
Lockport, Metal Plug, reduced list.60&5%
Self Measuring:
Enterprise, ₩ doz. $36.00.....40%
Lane's, ₩ doz. $36.00.....33⅓%
National Measuring, ₩ doz. $36.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75c&5%
Good Brands.....75c&10@75c&10c&10%
Fair Brands.....80@80c&10%
Second Quality.....80c&10@80c&5%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....25%

Fixtures, Grindstone—
Net Prices:

Inch....	15	17	19	21	24
Per doz.	$2.90	3.10	3.30	3.80	4.60

Stowell's Giant Grindstone Hanger.....₩ doz. $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's Patent.....60&10@60&10&10%

Fluting Machines—
See *Machines, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Aug. 1, 1899, list.
Hay, 2 tine.....65%
Hay, 3 tine.....66⅔%
Manure, 4 tine.....70%
Manure, 5 and 6 tine.....70%
Spading.....70c&5%
Iowa Dig-Ezy Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....70%
Victor, Header.....60&30%
Champion, Hay.....66⅔%
Champion, Manure.....70%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
Plated.—See *Spoons.*

Frames—
Saw—
Red, Polished and Varnished..doz. $1.15 & $1.30
White.....*doz. 75@80c*

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	2	3	4	6	8	10
Best.	$1.40	1 60	1.85	2.30	3.00	3.90
Good	$1 25	1.35	1.70	2.05	2 65	3.50
Fair.	$1.00	1.10	1 30	1.75	2.30	2.90

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—

	Per 1000 Feet.
Hemp Fuse	*$2.60*
Cotton Fuse	*2.90*
Single Taped Fuse	*3.50*
Double Taped Fuse	*4.70*
Triple Taped Fuse	*5.70*

Gates, Molasses and Oil—
Stebbin's.....*80@80c&10%*

Gauges—
Marking, Mortise, &c......55c&10@55c&10c&10%
Barrett's Comb. Roller Gauge.....₩ doz. $6.75@7.00
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....20&10%
Wire, Brown & Sharpe's.....20%
Wire, Morse's.....20%
Wire P., S. & W. Co.....10@10&5%

Gimlets—
Nail, Metal, Assorted.gro. $1.40@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted. gro. $4.00@4.25
Spike, Wood Handled, Assorted gro. $5 00@5.25

Glass, American Window
List Jan 1, 1898.
Small lots from store:
Single, Eastern.
First Bracket.....85%
Second and Third Brackets..85&10%
Eastern, All Other Brackets.85&25%
Double, Eastern.
First Bracket.....85%
Second, Third, Fourth and Fifth Brackets.....85&10%
All Other Brackets. .... 85&20%
From Jobbers or Factory, with Freight Allowance, except in Eastern district:
Carloads, Single Strength.
First Bracket.....85&25%
Second and Third Brackets....89%
All Above.....90&5%
Carloads Double Strength
First Five Brackets 89%
60 inch Bracket.....90%
70 to 100 inch Bracket, inclusive 90&10&5%
All Above.....90&20%

Glue—Liquid, Fish—
List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts.)..... 35½&8%
List C, Cans (½ gal., gal.) ....25@45%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Common Grade.....gro. $5.00@6.00
Allerton's Axle:
1 lb Tins, ₱ gr.....$9.00
3 lb Tin Pails, ₱ doz., $2.00; 5 lb, $3.00; 10 lb, $6.00.
25 lb wood pails.....₱ doz. $12.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs..₱ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake
1 qt. cans, per doz. $2.00; 2 qt. $3.20; 1 gal. cans per doz. $6 00; 3 gal. $16 00; 5 gal $24.00. } 10%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
gro.
Peg Patent, Leather Top..$4.90@5.25
Peg Patent, Plain Top....$3.50@3.75
Sewing, Brass Ferrule. ...$1.50@1.60
Saddlers', Brass Ferrule..$1.35@1.45
Peg, Common.....$1.25@1.35
Brad, Common.....$1.50@1.75

Halters and Ties—
Covert mfg. Co., Web.....45&2%
Covert Mfg. Co., Jute Rope.....45&2%
Covert Mfg. Co., Sisal Rope.....30&2%
Covert's Saddlery Works', 98 list, Web.. 60&10%
Covert's Saddlery Works, Leather 60&10%
Covert's Saddlery Works, Jute....60&5%
Covert's Saddlery Works, Sisal.....60%
Covert's Saddlery Works, Manila..60&5%
Covert's Saddlery Works, Cotton.....70%

Hammers—
Handled Hammers—
Heller's Machinists'.....50@50&5%
Heller's Farriers.....50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&10%
Peck, Stow & Wilcox.....40@40&5%
Fayette R. Plumb:
Artisans' Choice, A. E. Nail....33⅓&5%
Engineers' and B. S. Hand.....50&10%
Machinists' Hammers.....50&10%
A. E. & A. E., Belt Face Nail....33⅓&5%
Riveting and Finners'.....33⅓&5%
Sargent's C. S. New List.....45@45&10

Heavy Hammers and Sledges—
3 lb. and under...lb. 45c
3 to 5 lb.....lb. 36c } 75&5@75
Over 5 lb.....lb. 30c } &10%
Wilkinson's Smiths'.....9½c@10c lb.

Handcuffs and Leg Irons
See *Police Goods.*

Handles—
Agricultural Tool Handles—
Hoe, Rake, Fork, &c.....50&10@60%
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—
Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted.....gro. $2.40@$2 60
Auger, large.....gro. $2 85@$3.00
Brad Awl.....gro. $1.50@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@$2 35; large, $2.75@$3.00.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.25; large, $2 35@$2.50.
Apple Socket Firmer, gro. ass'd, $1.75@$2.52; large, $2 25@$2 50
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing.gro.ass'd, $2.50@$2.75; large, $2.65@$2.85
File, assorted.....gro. $1.00@$1.15
Hammer, Hatchet, Axe, &c...50&10%
Hand Saw, Varnished, doz. 75@80c
Not Varnished.....55@60c
Plane Handles:
Jack, doz. 25@25c; Jack Bolted.. 55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Doz	*$1.10*	*1.45*	*1.80*	*2.10*	*2.75*

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*
Doz	*$1.50*	*2.00*	*2.60*	*3.25*

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Coleman Hardware Mfg. Co.:
Czar Ball Bearing.₱ doz. pair $8.50
No. 10 Roller Bearing..doz. pr. 5.50
No. 20 Roller Bearing..doz. pr. 4.50
Nickel.....50%
J. G. C.....50&2&10%
Lane Bros.:
Parlor, Standard.....40&5&2½%
Parlor, New Model.....40&2½%
Barn Door, Standard.....60&2½%
Covered.....50&10&10%
Special.....60&5%
Lawrence Bros.:
Crown.....60%
New York.....60%
Sterling.....60%
McKinney Mfg. Co.:
No. 2, Standard, $18.....60&10%
No. 1, Special, $13.....60&10%
Stowell Mfg. and Foundry Co..
Badger.....60%
Baggage Car [illegible].....33⅓%
Climax Anti-Friction.....50%
Elevator.....40%
Interstate.....50&10%
Magic.....50%
Matchless.....50&10%
Nansen.....50&10%
Parlor Door.....50%
Railroad.....50&10%
Street Car Door.....50&10%
Steel, Nos. 300, 400, 500.....40&15%
Wild West.....50&5%
Zenith for Wood Track.....50&10%
Taylor & Boggis Foundry Co.:
Kidder's.....50@50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
L. T. Roller Bearing.....60&10%
New Era.....50&10%
New Richards.....60%
O. K. Roller Bearing.....60&10&5%
Prindle Improved.....60&10%
Richards' Improved.....60&10%
Richards' Single Track.....50&10%
Wilcox Dwarf Roller Bearing.....40&10%
Wilcox-Ives.....60&10%
Wilcox Tandem Roller Bearing..60&10%
Wilcox Trolley Ball Bearing.....40%
Wilcox Trolley Roller Bearing..50%
Wilcox Trolley Roller Bearing, Fire.....40&10%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—
McKinney's Perfect Hasp ₱ doz 10&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—
Best Brands.....40&10@50%
Cheaper Brands....50&10@50&10&5%
Note.—Net prices often made.

Hay and Straw Knives—
See *Knives.*

Hinges—
Blind and Shutter Hinges—
Acme and Dixie Shutter:

No	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.65*	*.60*	*.55*	*.47*

Buffalo and Queen City Reversible Shutter:

No	*1*	*1½*	*2*
Doz pair	*$0.65*	*.60*	*.55*

Lull & Porter Old Style Shutter:

No	*1*	*1½*	*2*	*2½*
Doz. pair	*$0 65*	*.60*	*.55*	*.47*

1868 Old Pattern Blind Hinge:

No	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.60*

Parker.....70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5.....60⅔&10%
Sargent's, Nos. 11 & 13.....7 &10@70&10&10%
Wrightsville H'dware Co.:
Acme, Lull & Porter.....65&10&5%
Buffalo Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Champion Gravity Locking, No. 75.75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pattern, Nos. 1, 3 and 5.....75%
Double Locking, Nos. 20 and 25.....70%
Empire, Nos. 101 and 103.....65&10%
Niagara Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Noiseless, Nos. 50, 60, 65 and 55.....65&10&5%
O. S. Lull & Porter.....65&10&10%
Pioneer, Nos. 060, 45 and 5½.....65&10&5%
Steamboat Gravity Locking, No. 10..75%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets $1.20.....20&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No	*1*	*2*	*3*
Hinges with Latches	*$1.90*	*2.50*	*4.25*
Hinges only	*1.30*	*1.55*	*3.20*
Latches only	*0.70*	*0.70*	*1.20*

New England:
With Latch.....doz $1.75@1.80
Without Latch.....doz. $1.40@1.45
Reversible Self-Closing:
With Latch.....doz. $1.65@1.75
Without Latch.....doz. $1.30@1.35
Western:
With Latch.....doz. $1.60@1.65
Without Latch.....doz. $1.00@1.05

Spring Hinges—
Holdback, Cast Iron.gro. $9.00@10.00
Non-Holdback, Cast Iron..... gro. $7.00@$7.50
J. Bardsley
Bardsley's Patent Checking.....10%
Bommer Bros.:
Bommer's.....33⅓%
Chicago Spring Butt Co.:
Chicago.....20%
Garden City Engine House..20%
Keene's Saloon Door.....20%
Triple End.....40%
Coleman Hdw. Co.:
Champion Holdback...₱ gr. $10.00
J. G. C.....₱ gr. $9.50
Nickel.....₱ gr. $9.00
Lawson Mfg. Co.:
Matchless.....25%
Matchless Pivot.....40%
Payson Mfg. Co.:
Oblique, Dbl. Acting.....50@50&5%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr..... $2.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable.....30%
Gem, new list.....25%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....25%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15, 1898:
Light Strap Hinges..66⅔%
Heavy Strap Hinges..70%
Light T Hinges....50&10%
Heavy T Hinges...60&10%
Extra Heavy T Hinges... 66⅔% } *Extra 25@25 &5%*
Hinge Hasps 45
Stanley's Corrugated Heavy Strap.....70%
Stanley's Cor. Ex. Heavy T. 66⅔%
Rolled Plate.....70@70&5%
Screw Hook and Strap. { *6 to 12 in..lb 3½@3¾c* / *14 to 20 in..lb. 3¼@3½c* / *22 to 36 in..lb. 3 @3¼c*
Screw Hook and Eye:
¾@1 inch.....lb 5½@5¾c
⅝-inch.....lb. 6½@6¾c
½-inch.....lb. 8½@8¾c

Hoes—
Eye—
Scovil and Oval Pattern, 60&5@60&10&5%
Grub, list Feb. 23, 1899.... 65@65&10%
D. & H. Scovil.....35%

Handled—
Aug. 1, 1899, List:
Field and Garden.....75&2%
Ladies', Boys', Toy and Onion... 70&10&10%
Street and Mortar .....75&7½&2%
Cotton.....70&10&10&5&2%
Planters'.....70&30%
Weeding.....75%
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe..... 75&2%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $4.50
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..... 75&20%
Kretsinger's Cut Easy, per doz....75&2%
Warren Hoe.....60%

Hog Rings and Ringers—
See *Rings and Ringers.*

Hoisting Apparatus—
See *Machines, Hoisting.*

Hollow Ware—
See *Ware, Hollow.*

Holders—
Bit—
Angular, ₱ doz. $24.00..... 45&10%
File and Tool—
Nicholson File Holders and File Handles.....33⅓%

Hooks—
Cast Iron—
Bird Cage, Reading..... } .50&10@60%
Bird Cage, Sargent's List... }
Clothes Line, Sargent's List.....35&10%
Ceiling, Sargent's List..... .40@40&10%
Clothes Line, Stowell's.....70%
Clothes Line, Reading List 65&10@65&10&10%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Sargent's List....35&10%
Coat and Hat, Wrightsville .....65&10%
Harness, Reading List.....70&10@75%

Wire—
Belt.....75@75&10%
Atlas, Coat and Hat:
Single Cases.....45%
10 Case Lots.....45&10%
Czar Harness.....50&10%
Wire Coat and Hat:
Acme.....60@60&5%
B. B.....70@70&5%
V Brace, Chief and Czar.....50&10%
Gem.....50&10%
Bright Wire Goods—See *Wire.*

Wrought Iron—
Box, or Case, Octagon Steel..... doz. $2.10@2.20
Cotton..... doz. $1.05@1.15
Picture, T. & S. Mfg. Co.....75%
Tassel, T. & S. Mfg. Co.....50&10%
Wrought Staples, Hooks, &c.— See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50

Grass.....Nos.	*1*	*2*	*3*	*4*
Best	*$1.50*	*1.75*	*2.00*	
Common	*$1.40*	*1.40*	*1.50*	*1.75*

Potato and Manure 70%
Whiffletree.....lb. 4¾c
Hooks and Eyes:
Brass.....60&10&10@70%
Malleable Iron.....70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook..... 60&10%
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—
See *Shoes, Horse.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 4¼@ 4¾c
3-ply Standard ..... ft. 5 @ 6 c
4-ply Standard.....ft. 8 @ 9 c
3-ply extra .....ft. 9 @10 c
4-ply extra .....ft. 11 @12 c
Cotton Garden, ¾-in., coupled:
Low Grade ..... ft. 6 @7 c
Fair quality.....ft. 8 @9 c

Irons—Sad—
From 4 to 10..... lb 3@3½c
B. B. Sad Irons..... lb. 3½@4c
Chinese Laundry.....lb. 5@5½c
Chinese Sad.....lb. 3½@3¾c
Mrs. Potts', per set:

Nos.	*50*	*55*	*60*	*65*
	75c	*70c*	*90c*	*85c*

New England Pressing.lb..3½@3¾c

Soldering—
Soldering Coppers.....lb. 21@23c
Covert Mfg. Co..... 20&2%

Pinking—
Pinking Irons.....doz. 50@60c

Jack Screws—See *Screws.*

Jacks, Wagon—
Covert Mfg. Co., Steel.....45&2%
Daisy.....70%
Ill. I. & B. Co Common.....70@75%
Lockport.....40@40&10%
Victor.....60%
Lane's Steel.....33⅓%

Kettles—
Brass, Spun, Plain....per lb. 22@24c
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—
See *Sharpeners, Knife.*

Knives—
Butcher, Shoe, &c.—
Dick's Butcher Knives.....40%
Foster Bros.' Butcher, &c.....30%
Nichols' Butcher Knives.....50%
Hay and Straw—See *Hay Knives.*

Corn—
Ft. Madison Cut-Easy, ₱ doz.....$3.25

Drawing—
Standard List.....70&5@...%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
Swan's.....70&10&2½%
Watrous.....30&10@40%
L. & I. J. White.....20&5@25%
Cautelo's Folding.....50@50&5%

Hay and Straw—
Blizzard.....$5.75@6.00
Iwan's Sickle Edge.....₱ doz. $11.50
Lightning.....$7.50

Mincing—
Buffalo.....₱ gro. $15.00
Smith's, ₱ doz., Single, $2; Double, $3 45@50%

Miscellaneous—
Farriers'.....doz. $2 00@3.00
Wostenholme's.....₱ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, Rubber tip, gro .....$1.35@1.40
Carriage, Jap. all sizes..gro. 30@33c
Door, Mineral.....doz. 68@70c
Door, Por. Jap'd.....doz. 75@80c
Door, Por. Nickel....doz. $2 10@2.20
Bardsley's Wood Door, Shutter, &c...10%
Picture, Sargent's.....60&10%
Snow's Victor.....50&10%

Ladders, Step—
Handy Ladder Works:

Extended Length. Feet.	Shipped Ready for Use.	Per doz.	Shipped K. D., Per doz.
4	7	$16.00	$14.00
5	9	19.50	17.00
6	11	24.50	21.00
7	13	29.50	25.00
8	15	34.00	29.00
9	17	39.00	32,00
10	19	43.00	35.00
11	21	46.50	40.00
12	23	51.00	45.00

Ladles—Melting—
L. & G. Mfg. Co.....60%
P., S. & W.....40@40&10%
Reading.....50&10%
Sargent's.....40@40&10%

Lanterns—Tubular—
Regular Tubular.....doz. $4.00@4.50
Side Lift Tubular....doz. $4.25@4.75
Square Lift Tubular..doz. $4.21@4.75
Other Styles.....40&10@40&10&5%
Meyrose Side Lift Tubular, doz. $8.50... 45&10%

Bull's Eye Police—
2¾-inch flash light....doz. $3.50@3.75
3-inch flash light.....doz. $4.00@4.25
2¾-inch regular.....doz. $3.25@3.50
3-inch regular.....doz. $3.50@3.75

Latches, Thumb—
Roggin's Latches.....doz. 32@33c

Lawn Mowers—
See *Mowers, Lawn.*

Leaders, Cattle—
Small.....doz. 45c; large, 55c
Covert Mfg. Co.....45&2%

Lemon Squeezers—
See *Squeezers, Lemon.*

Lifters, Transom—
Dickson:
3 x 4 ft. x ¼.....₱ 100 $11.00
Other sizes, Iron.....70&10%
Other size, Brass and Bronze.....70%
Excelsior.....60@60&10%
Payson's:
Solid Grip Nos. 643 and 644, ₱ 1.00
Bronzed Iron.....70%

Lines—
Wire Clothes, Nos...	*18*	*19*	*20*
100 feet	*$2.90*	*2 50*	*1 95*
75 feet	*$2.15*	*1.90*	*1.65*

Ossawan Mills.
Crown Solid Braided Chalk.....33⅓%
Mason's, No. 0 to No. 5.....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....30%

Locks, &c.— Cabinet—
Cabinet Locks.....33⅓@33⅓&7½%

Door Locks, Latches, &c.—
[Net prices are very often made on these goods.]
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40 & 0%
Sargent & Co.....40@40&10%
Slaymaker-Barry Co.....30@35%
Snow's Victor.....50&10%

Elevator—
Stowell's.....33⅓%

Padlocks—
Wrought Iron, list Dec. 3, '97.....70@70&10%
Dog Collar, S. B. Co.....40%
R. & E. Mfg. Co. Wrt. Steel and Brass.50%
S. B. & Co.....40%

Sash, &c.—
Fitch's Bronze and Brass.....66⅔%
Fitch's Iron.....70%
Ives' Patent.....62½&10@66⅔&10%
Oefinger's Automatic.....50%
Payson's Perfect.....70%
Payson's Signal (new list).....75%
Reading.....60&10&10@70%

Machines—
Boring—
	Without Augers. Upright.	Angular.
Improved No. 3...	$4.25	No. 1 $5.00
Improved No. 4...	3.75	No. 2 3.38
Improved No. 5...	2.75	
Jennings'.....	2.50	3.00
Millers' Falls.....		5.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500..	5.10	No. 200 6.45

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%

Washing—
Wayne American, ₱ doz. $27.00
Western Star, No. 2, ₱ doz.....28.00
Western Star, No. 3, ₱ doz.....30.00
St. Louis, No. 41, ₱ doz..60.00
(Carload lots 10% off, freight allowed.)

Mallets—
Hickory.....45&5@50&5%
Lignumvitæ.....45&5@50&5%
Tinners', Hickory and Applewood, doz.....50@55c
Fiber Head Stearns'.....30&10%

Mats—
Door—
Elastic Steel (W. G. Co.).....10%

Mattocks—
See *Picks and Mattocks.*

Meat Cutters—
See *Cutters, Meat.*

Milk Cans—See *Cans, Milk.*

Mills— Coffee—
Box and Side, list Jan. 1, '88.....60&5@60&10&5%
Net prices are often made on some goods which are lower than above discounts.
Enterprise Mfg. Co.....25@30%
National, list Jan. 1, '94.....30%
Parker's Columbia and Victor....60&10%
Parker's Upright.....30&10@40%
Swift, Lane Bros.....30%

Mincing Knives—
See *Knives, Mincing.*

Molasses Gates—
See *Gates, Molasses.*

Money Drawers—
See *Drawers, Money.*

Mowers, Lawn—
Net prices are generally quoted.
Cheap.....all sizes. $2.00
Good.....all sizes, $2.50@2.75

	10	12	14	16-inch
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Pennsylvania and Continental 60&10&5%
Quaker City.....70&5%
Great American.....70&5%
Philadelphia:
Styles M., S., C., K., T.....70&10%
Style A, all Steel.....60&10%
Style E, Low Wheel.....60&10%
Style E, High Wheel.....70&10%
Drexel and Gold Coin, low list.....50%

Nails—
Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899.....35@ 5&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks

Horse—
Nos.	6	7	8	9	10
A. C.	25¢	23¢	22¢	21¢	21¢ 40&5%
Capewell	19¢	18¢	17¢	16¢	16¢10&5%
C. B. K.	25¢	25¢	22¢	21¢	21¢...40%
Champlain	28¢	26¢	25¢	24¢	23¢ 40&5&2%
Maud S.	25¢	23¢	22¢	21¢	21¢...50%
Neponset	23¢	21¢	20¢	19¢	18¢...40%
Putnam	23¢	21¢	20¢	19¢	18¢.33⅓&%
Standard	23¢	21¢	20¢	19¢	18¢...40%
Star	23¢	21¢	20¢	19¢	18¢ 35& 5%
Vulcan	23¢	21¢	20¢	19¢	18¢ 25&10%

Picture—
	1½	2	2½	3	3½ in.
Brass Head.	*.45*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head...	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*

Nut Crackers—
See *Crackers, Nut.*

Nuts—
List Feb. 1, '99.
Cold Punched. *Off*
Mfrs. or U. S. Standard. list.
Hexagon, plain.....4.40@4.50c
Square, plain.....4.30@4.40c
Square, C. T. & R.....4.10@4 20c
Hexagon, C. T. & R.....4.70@4.80c
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square.....5.20@5 30c
Hexagon.....5.50@5.60c
NOTE.—*Tapped Nuts are now 2-10c. higher than above.*

Oakum—
Best or Government.....lb. 6¼c
Navy.....lb. 5 c
U. S. Navy.....lb. 5¾c
Plumbers' Spun Navy.....5 c
In carload lots ¼c lb. off f.o b. New York.

Oil, Axle—
Snow Flake: (33⅓&10%)
1 pt. cans, per doz.....$3.00
1 qt. cans, per doz.....$4.80
1 gal. cans, per doz.....$15 00
5 gal. cans, per doz.....$66.00

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....40&10@50%
Tin or Steel.....60¢10@65%
Zinc.....60¢10@65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
Wilmot & Hobbs Mfg. Co....70@70&10%

Openers—
Can—
French.....doz. 35c
Iron Handle.....doz. 25@27c
Sprague, Iron Hdle..per doz. 35@40c
Sardine Scissors...doz. $1.75@2.00
Tip Top.....per doz. $0.75
National, ₱ gro.....$1.75@$2.00
Stowell's.....per doz. 40@45c

Egg—
Nickel Plate.....per doz., $2.00
Silver Plate.....per doz., $4.00

Packing—
Rubber—
Standard, fair quality....70&10@75%
Inferior quality.....75&10@80%
Extra.....60&5@60&10&5%
Jenkins' Standard, ₱ lb 80¢....25@25&5%

Miscellaneous—
American Packing.....9@10c lb.
Cotton Packing.....13@14c lb.
Italian Packing.....10½@11¼c lb.
Jute.....5@5¼c lb.
Russia Packing.....12@13c lb.

Pails—
Creamery—
S. S. & Co., with gauges.. No 1 $6.50; No. 2, $6.75 ₱ doz.

Galvanized—
Price per gro.
Inch.....	*10*	*12*	*14*
Water, Regular..	*18.00*	*21.00*	*24.00*
Water, Heavy....	*22.00*	*25.00*	*28.00*
Fire, Rd. Bottom.	*31.00*	*33.00*	*35.00*
Well.....	*27.00*	*29.00*	*31.00*

Pans—
Dripping—
Standard List.....60@60&5%
Fry—
Standard List.....75&10@80%

Roasting and Baking—
Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10, $5.00; 20 $5.50; 30, $6.00
Simplex, ₱ gro., No. 40, $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37 50; 160, $43.00.

Paper—
Building Paper—
	Per roll 500 sq. ft.
Rosin Sized Sheathing:	
Light wt., 20 sq. ft. to lb.	*$0.40@0.45*
Medium wt., 12 sq. ft. to lb.	*$0.60@0.65*
Heavy wt., extra quality.	*$0.95@1.05*
Medium Grades Water Proof Sheathing	*$0.80@1.25*
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton.	*$43.00@45.00*
York Haven Waterproof Sheathing	$1 35@1.75

Tarred Paper.
1 ply (roll 200 sq ft.), ton.$32 00@37.00
2 ply, roll 100 sq. ft.....75c
3 ply, roll 100 sq. ft.....$1.00

Sand and Emery—
List Dec. 23, 1899...50¢10@50¢10¢5%
See *Trade Report.*

Parers—
Apple—
Advance	₱ doz.	$4.50
Baldwin	₱ doz.	$5.00
Bonanza	each	$5.00
Dandy	each	$7.50
Eureka, 1898	each	$16.00
Family Bay State	₱ doz.	$12.00
Hudson's Little Star	₱ doz.	$4.00
Hudson's Rocking Table	₱ doz.	$5.50
Improved Bay State	₱ doz.	$27.00@30.00
New Lightning	₱ doz.	$5.50
Reading 72	₱ doz.	$4.00
Reading 78	₱ doz.	$7.00
Turn Table '98	₱ doz.	$5.50
White Mountain	₱ doz.	$4.00

Potato—
Saratoga.....₱ doz. $5.50
White Mountain.....₱ doz. $4.50

Paris Green—
Arsenic, kegs or casks..lb. 12½@13 c
Kegs, 100 to 175 lb.....lb. 13 @13½c
Kits, 14, 28, 56 lb.....lb. 14 @14½c
Paper boxes, 2 to 5 lb...lb. 14 @14½c
Paper boxes, 1 lb.....lb. 14½@15 c
Paper boxes, ½ lb.....lb. 15½@16 c
Paper boxes, ¼ lb.....lb. 16½@17 c

Picks and Mattocks—
List Feb. 23, 1899.....65@65&10%

Pinking Irons—
See *Irons, Pinking.*

Pins—
Escutcheon—
Brass.....60@60&5%
Iron, list Nov. 11, '85.....60@60&5%

Pipe, Cast Iron Soil—
Factory Shipments.
Standard, 2-6 in.....65&10%
Extra Heavy, 2-6 in.....70%
Fittings.....75%

Pipe, Merchant, Boiler Tubes, &c.—
Carloads to Consumers.
Merchant Pipe.
	Black.	*Galvanized*
⅛ to ⅓ inch	63%	50 %
¾ to 8 inch	68%	55 %
9 to 12 inch	65%	50 %

Boiler Tubes
	Iron.	*Steel.*
1 to 1¼ inch	30%	26%
1¾ to 2¼ inch	35%	32%
2¼ to 8 inch	55%	52%
2½ and 9 inch to 13 inch	45%	42%

Casing.
	S. & S.	*I. Jt.*
2 to 2¾ inch	42%	
3 to 4½ inch, and 7⅞ to 12½ inch	56%	
4¾ to 7¼ inch	60%	
7⅞ inch	47½%	

NOTE.—*The old list is still used by some jobbers, and net prices are often quoted.*

Planes and Plane Irons—
Wood Planes—
Molding.....40&2½@40&5%
Bench, First quality.....45&10@45&10&5%
Bench, Second quality.....50&10@50&10&5%
Bailey's (Stanley R. & L. Co) 50&10@50&10&10%
Gage Self Setting.....35%

Iron Planes—
Bailey's (Stanley R. & L. Co) 50&10@50&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10@25&10&10%
Sargent's.....50&10@60%

Plane Irons—
Wood Bench Plane Irons..35@35&5%
Buck Bros.....30%
Butcher's.....$5.00@5.25 to £
Stanley R. & L. Co...50&10@50&10&10%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand.
Kohler's Eclipse.....₱ doz. $9.00

Plates—
Felloe.....lb. 3½@3¾c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00.....50%

Pliers and Nippers—
Button Pliers.....65&10@70&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45.

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$1.75	*$2.00*	*$2.75*	*$3.75*

Acme Nippers.....40@40&5%
Bernard's:
Parallel Pliers, &c.....33⅓%
Paragon Pliers.....50
Lodi Pliers.....50%
Elm City Fence Pliers.....33⅓%
Heller's Farriers' Nippers, Pincers, ... and Tools 50@50&5%
Morrill's Parallel, ₱ doz. $12.00...30&5%
P., S. & W. Cast Steel.....30&10@40%
P., S. & W. Tinners' Cutting Nippers. 40@40&5%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—
Plumbs and Levels.....70¢10¢10@75¢10¢10%
Disston's.....70%
Pocket Levels.....75&10&10@75&10%
Stanley R. & L. Co.....70&10&10@75&10%
Stanley's Duplex.....25&10@25&10&10%
Woods' Extension.....33⅓%

Poachers, Egg—
Buffalo Steam Egg Poachers, ₱ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50.....; 50%

Points, Glaziers'—
Bulk and 1 lb. papers.. lb. 11¼@12 c
½-lb. papers.....lb. 12 @12¼c
¼-lb. papers.....lb. 12½@13½ c

Pokes, Animal—
Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison, Western.....₱ doz. $3.75

Police Goods—
Manufacturers' Lists.....25@25&5%
Tower's.....25%

Polish—Metal—
Prestoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....33⅓&40%
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz. $1.50

Stove—
Black Eagle Benzine Paste, 5 lb cans... ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans..... ₱ doz. 75¢
Black Jack Paste, ¾ lb cans. ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's Black Silk, 5 lb pail.....₱ lb 12¢
Wynn's Black Silk, ½ lb box, ₱ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₱ doz. $0.75
Wynn's Black Silk, 8 oz. liq., ₱ doz. $1.00

Poppers, Corn—
Round or Square:
1 qt.....gro. $7 00@$8.00
1½ qt.....gro. 9 50@ 10 50
2 qt.....gro. 10.50@ 11.50
Quincy Corn Popper, 1 qt., ₱ gr. $16.50; 2 qt., $19.00.

Post Hole and Tree Augers and Diggers—
See also *Diggers, Post Hole, &c.*

Potato Parers—
See *Parers, Potato.*

Pots—
Glue—
Enameled.....40&5@40&10%
Tinned.....40@40&5%

Powder—
In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each.....25c
In Kegs:
Duck, 6½-lb. kegs.....$2.25
Duck, 12½-lb. kegs.....$4.25
Duck, 25-lb kegs.....$8.00
Rifle, 6¼-lb. kegs.....$1.25
Rifle, 12½-lb. kegs.....$2.25
Rifle, 25-lb. kegs.....$4.00
King's Smokeless: (25&10&2%)
Keg (25 lb bulk).....$20 00
Half Keg (12½ lb bulk).....$10.25
Quarter Keg (6¼ lb bulk).....$5.25
Canister (1 lb bulk).....$0.90
Case, 1 lb Canisters (50 lb bulk).....$45.00
Half Case, 1 lb Canisters (25 lb bulk).....$22.75
King's Semi-Smokeless: (20&2%)
Keg (25 lb bulk).....$16.00
Half Keg (12½ lb bulk).....$8.25
Quarter Keg (6¼ lb bulk).....$2.75
One Pound Can, bulk.....$0.50

Presses—
Fruit and Jelly—
Enterprise Mfg. Co.....20@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—
Crown, ₱ doz. $18.00.....50%
Crown Prince, ₱ doz. $15.00.....50%
Cyclops.....40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11.....40%
Eureka, 5 lb, doz., $16.00; 3 lb $15...40%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
National, ₱ doz. $24.00.....50%
Miller's Falls, No. 3, per doz. $12.00..... 15&10%
Pelican, ₱ doz. $9.00.....40&10%
Scranton No. 1 and 2, ₱ doz.....$9.00
Scranton, No. 3, ₱ doz.....$6.50

Pulleys—

Hay Fork, Swivel or Solid Eye..... doz. $1.50@1.75
Hay Fork, Stowell's Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... 40%
Hot House, Awning, &c.....60@60&10%
Japanned Clothes Line.....60@60&10%
Japanned Screw.....70&10&10%
Japanned Side.....70&10&10%
Stowell's Ceiling or End, Anti-Friction 60%
Stowell's Dumb Waiter, Anti-Friction .. 60&10%
Stowell's Electric Light.....60%
Stowell's Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Sense, 1¾ in.... ₱ doz., 20¢; 2 in., 22¢.
Empire.....1¾ in., 17¢; 2 in., 19¢
Grand Rapids All Steel Noiseless.... 40%
Ideal No. 13.....1¾ in. ₱ doz., 20¢
Improved.....1¾ in., 17¢; 2 in., 19¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy.....1¾ in., 16¢; 2 in., 19¢
Star.....1¾ in., 16¢; 2 in., 19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2¼ in..... ₱ doz. 25¢
No. 9, 1¾ in..... ₱ doz. 20¢
Extra for Plated Finish..., ₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing..... ₱ doz 10¢
Tackle Blocks—See *Blocks*.

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....70&10@75%
Pump Leathers, all sizes.....gro. $6.00
Barnes Dbl. Acting (low list).....50%
Flint & Walling's Fast Mail.....50@55%
Flint & Walling's Pitcher Spout. 70&10%
Loud's Suction Pumps, U. H. Co.....20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....20%

Punches—

Revolving (4 tubes)...doz. $4.00@4.50
Saddlers' or Drive, good..doz. 65@70c
Spring, good quality.....$2.00@2 25
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....45%
Niagara Solid Punches.....55%
Spring, Leach's Pat.....15%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co..... 35@35&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....55%

Rail—

Barn Door, &c.—

Barn Door, Light..In. ½ ⅝ ¾
100 feet..... $2.00 $2.50 $3.00
B. D., for N. E. Hangers:
Small. Med. Large.
100 feet.....$2 20 2.70 3.20
Sliding Door, Bronzed Wr't Iron, ft. 6½c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1¼ in..... lb. 36c..50%
Cronk's Double Braced Steel Rail, ₱ foot..... 3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch....$3.00
Lanes' Standard, ₱ 100 ft..... 4.25
Lawrence Bros'.....₱ ft. 4½¢
McKinney's None Better.....₱ ft. 3¢
McKinney's Standard.....₱ ft. 3½¢
Moore's, Wr't. Bracket, Steel..... 3½¢
Stowell's Steel Rail, Plain 15%

Rakes—

Aug. 1, 1899, List:
Cast Steel..... 70&&5%
Malleable.....70@10%
Lawn Rakes, Metal Head, per doz., 20 teeth, $3.25; 24 teeth $3.50.
Fort Madison Red Head Lawn....$3 25
Fort Madison Blue Head Lawn.....$3 00
Kohler's Lawn Queen, 24-tooth, ₱ doz. $4.00
Kohler's Paragon, 24-tooth, ₱ doz. $3.00
Kohler's Steel Garden, 14-tooth, ₱ doz. $3.50
Kohler's Malleable Garden, 14-tooth, ₱ doz.....$2.50

Rasps, Horse—

Disston's 75%
Heller Bros.....60&10&10%
McCaffrey File Co. Horse Rasps..... 60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files*.

Razors—

Fox Razors, No. 42... ₱ doz. $20.00
Fox Razors, No 44... ₱ doz $24.00
Fox Razors, No. 82, Platina, ₱ doz $24.00
} 40% dis.

Razor Strops—

See *Strops, Razor*.

Reels—

Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes..... 25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%

Registers—

Black Jap.....50@50&10%
White Jap..... 40%
Bronzed..... 40%
Nickel Plated..... 50%
Electro Plated..... 40%

Riddles, Grain or Sand—

16 in. per doz.....$2.00@$2.25
17 in. per doz.....$2.25@$2.50
18 in. per doz.....$2.50@$2.75

Rings and Ringers—

Bull Rings—

	2	2½	Inch.
Steel.....	$0 75	0.83	0.88 doz.
Copper.....	1.10	1.30	1.50 doz.

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.50@5.00
Hill's Ringers, G. I.....doz. 75c
Blair's Rings.....₱ gr. $5.75@6.00
Flair's Ringers.....₱ doz. $0.90@1.00
Brown's Rings.....₱ gro. $6.00@6.25
Brown's Ringers.....₱ doz $1.00@1.10c
Perfect Rings.....₱ gro. $9.00@9.50
Perfect Ringers, ₱ doz.....$1.25@1.35
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $3.50

Rivets and Burrs—

Copper.....50@50&10%
Iron or Steel:
Tinners' .....62½@62½&10%
Miscellaneous ..... 62½@62½&10%

Rivet Sets—See *Sets*.

Roasting and Baking Pans—See *Pans, Roasting and Baking*.

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list. 60&10&10@70%
Lane's, Stay ..... 33⅓&5%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

NOTE.—*Carload lots, except on Jute Rope, ½c. per lb. less than the following prices, which are for small lots.*

Manila, 7-16 in. and larger. lb. .. @13½c
Manila.....⅜-inch. lb. .. @14 c
Manila..¼ and 5-16 in. lb. .. @14½c
Manila, Tarred Rope, 15 thread.....lb .. @13½c
Manila Hay Rope Med'm. lb .. @13½c
Sisal, 7-16 in. and larger. lb. .. @ 9 c
Sisal.....⅜-inch. lb... @ 9½c
Sisal.....¼ and 5-16 in. lb. .. @10 c
Sisal, Hay Rope, 2 to 10 ply.....lb. .. @ 9 c
Sisal, Tarred, Medium Lath Yarn.....lb... @ 8½c
Cotton Rope:
Best, ¼-in. and larger..lb. 13@14 c
Med'm, ¼-in. and larger lb. 10@12 c
Com., ¼-in. and larger. lb. 8@10 c
Jute Rope, No. 1, ¼ in. and up .....lb. .. @7 c
Jute Rope No. 2, ¼ in. and up..... .....lb. .. @6¼c

Wire Rope—

Galvanized.....30&2½&2½
Plain..... 35&2½&2½

Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....60%

Rules—

Boxwood..75&10&10&10@75&10&10 &10&10%
Ivory ...40&10&10@40&10&10&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber ... .50&10%
Stanley R. & L. Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory..... .35&10&10@35&10&10&10%

Sad Irons—See *Irons, Sad*.

Sand and Emery Paper and Cloth—

See *Paper and Cloth*.

Sash Cords—See *Cord, Sash*.

Sash Locks—See *Locks, Sash*.

Sash Weights—

See *Weights, Sash*.

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage*.

Saw Frames—

See *Frames, Saw*.

Saw Sets—See *Sets, Saw*.

Saw Tools—See *Tools, Saw*.

Saws—

Atkins' Circular..... .....50@50&10%
Atkins' Band .....50&10@60%
Atkins' Cross Cuts ..... 35&5%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw..... .....40%
Atkins' Wood Saws 40%
Atkins' Hand, Compass, &c..... ....40%
Disston Circular Solid and Inserted Tooth..... .. 50%
Disston Band 2 to 14 in. wide.....60%
Disston Band ¼ to 1¾.....70%
Disston Crosscuts.....45@45&10%
Disston Narrow Crosscuts....50@50&10%
Disston Mulay, Mill and Drag.....50%
Disston Framed Woodsaws..35@35&7½%
Disston Woodsaw Blades....40@40&7½%
Disston Woodsaw Rods..... .....25%
Disston Handsaws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25@25&7½%
Disston Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination... 30@30&7½%
Disston Compass Keyhole &c25@25&7½%
Disston Butcher Saws and Blades.....
C. E. Jennings & Co.'s.....25&5@30&5%
Peace Circular and Mill..... .....50%
Peace Cross Cuts, list Jan. 1, '99.....50%
Peace Hand, Panel and Rip.....30%
Richardson's Circular and Mill.....50%
Richardson's X Cuts, list Jan. 1, '99..50%
Richardson's Hand, &c.....30%
Shoonds' Circular Saws.....50%
Simonds' Crescent Ground Cross Cut Saws..... .....35%
Simonds' One-Man Cross Cuts....40&10%
Simonds' Gang Mill, Mulay and Drag Saws.....45@45&5%

Hack Saws—

Disston Concave Blades.....25%
Disston Keystone..... .....30%
Disston Hack Saw Frames.....30%
Griffin's complete.....40&10%
Griffin's Hack Saw Blades.....40&10%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scale Beams—

See *Beams, Scale*.

Scales—

Family, Turnbull's.... ...30@30&10%
Hatch, Counter:
Platform, 4 lb. by ½ oz... doz. $5.75
Two Platforms, 8 lb. by ½ oz..... doz. $16 00
Union Platform, Plain....$1.75@2.00
Union Platform, Striped..$1 85@2.15
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Chatillon's Grocers' Trip Scales.....50%
Pelouze Scales—Family, Candy, Grocers' and Postal .....New list net
"The Standard" Portables 45%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle .....doz $2.25@2.75
Box, 2 Handle..... ... doz. $3.75@4.00
Ship, No. 1, doz. $3.50; No 2, $2.25@2.40
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....40&10%
Foot, W. E. Pratt Mfg. Co..... ₱ doz. $1.15@$1.25

Screens, Window and Frames—

Bonanza Window Screens...50&10&2½%
Maine Window Screen Frames 40&10&5%
Phillips' Window Screen Frames.....60%
Porter's Extension Window Screens.. 50&10%
Wabash Spring Adj. Screen. 50%

Screw Drivers—

See *Drivers, Screw*.

Screws—

Bench and Hand—

Bench, Iron..doz. 1 in., $3.00@3.25; 1⅛, $3.50@3.75; 1¼, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@3.75
Hand, Wood.....35@40%
Hand, Grand Rapids.....35%
Hand, R. Bliss Mfg Co..... .....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....70&10&10&5%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....70&10&10%
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Millers Falls.....50&10&10%
Millers Falls, Roller .....50&10%
P., S. & W.....40&5@40&10%
Sargent.....60&10@60&10&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass..... 50@50&10%

Set and Cap—

Set (Iron or Steel) .....60@60&10%
Sq. Hd. Cap.....55%
Hex. Hd. Cap.....60%

Wood—

List Jan. 1, 1900.

Flat Head, Iron.....80%
Round Head, Iron.....75%
Flat Head, Brass.....77½%
Round Head, Brass.....72½%
Flat Head, Bronze.....72½%
Round Head, Bronze.....70%
Drive Screws.....80%
} Extra 10 & 10&10 often given.

Scroll Saws—See *Saws, Scroll*.

Scythes—

Grass Scythes:
Natural Finish, per doz. $7.75@8.00
Pol. Blade.....per doz. $8.25@8.50
Painted or Bronzed..per doz. $8.25
Weed and Bush..per doz. $7.50@7.75

NOTE.—*The above are about the association prices to small trade, but are freely cut by jobbers.*

Scythe Snaths—

See *Snaths, Scythe*.

Seeders—

Raisin—

Enterprise.....35@30%

Sets—

Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools.... doz. $2.50@2.60
Aiken's Sets, Awl and Tools: No. 20, ₱ doz. $10.00.60&10@60&10&5%
Fray's Adj. Tool Holders...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... .....50%
Millers Falls Adj. Tool Hold's, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior: No. 1, $7.50; No. 2 $4.00; No. 3, $5.50..... .....30&10@30&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.... ₱ doz.....$9.00

Nail—

Round, assorted.....gro. $3.25@3.75
Octagon.....gro. $4.25@4.75
Knurled, Good.....gro. $6.00@6.50
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Snell's Corrugated, Cup Pt.....50%
Snell's Knurled, Cup Pt..... ....66⅔%

Rivet—

Regular list.....70@70&10&5%

Saw—

Aiken's Genuine.....₱ doz. $4.50@5.00
Aiken's Imitation .....₱ doz. $3.00@3.10
Atkin's Criterion.....40%
Atkin's Adjustable.....40%
Bemis & Call Co.'s Cross Cut..... .30%
Bemis & Call Co.'s Plate..... .....20%
Bemis & Call Spring Hammer.....30%
Disston's Star and Mona ch.....25%
Hammer, Bemis & Call Co.'s new Pat. 45%
Morrill's No. 1, $15.00..... .....40&20%
Nos. 3 and 4, Cross Cut, $23.00..40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Taintor Positive, ₱ doz. $18 .....60%

Sharpeners, Knife—

Tanite Mills ₱ gross, $14.40....25@33⅓%

Shaves, Spoke—

Iron.....doz. $1 00@1 25
Wood.....doz. $1.75@2.25
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00.....15&10%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good.....	*$13.00*	*15.00*	*17 00 gro.*
*Cheap.... *	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap..60&10&10@70&5%
" Nickel.....60@60&5%
Fair qual. Jap.....75&10@80%
" Nickel.....70&10@75%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40@40&5%
National Cutlery Co., Nickel .....60&10%
National Cutlery Co., En Hdls...70&10%
Seymour's, Jap.....70%
Seymour's Nickel.....60%
Seymour's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....15%

Tinners' Snips—

Forged Handles, Steel Blades..20&10%
Malleable Handles, Laid with Steel. 40%
Forged Handles, Steel Blades, Berlin.. 40&10%
Niagara Snips.....40%
Seymour's..... .....40@40&5

Pruning Shears and Tools—

Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 25@25&10%
John T. Henry Mfg. Company's Pruning Shears all grades.....50&5%
Orange Shears.....50&30%
Grape.....50&10%
Tree Pruners.....75%
Nagley's Pruning Shears....₱ doz. $8.00
P., S. & W. Co.....33⅓&33⅓&10%
Seymour's.....60&10&10@70&5%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller.....60&10@60&10&5%
Patent Roller Hatfield's, Sargent's list, 80&10@80&10&7%
Reading..... 70&10@75%
R. & E.....45&10%
Wrightsville, Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E.....60@60&10%
Sargent's list.....50&5@50&10&5%

Shells—

Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Club, Rival, Climax, 10 and 12 gauge.. 65&5%
Paper Shells, Empty:
Club, Rival, Climax, Ideal, 14, 16 and 20 gauge ($7.50 list).....20&10&5%
Club, Rival, Climax, League, 10 and 12 gauge.....33⅓&5%
Acme, Leader, New Rapid, Ideal, Smokeless, 10, 12, 16 and 20 gauge. 33⅓&10%
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%
Primrose Club, Blue Rival, Yellow Rival, New Climax, 10, 12, 16 and 20 gauge.....15%
High Base, Nitro, Repeater, Defiance, New Victor, 10, 12, 16 and 20 gauge 15%

Shells, Loaded—

Loaded with Black Powder..... 40&5%
Loaded with Nitro Powder..... 40&10&10&5%

Shoes, Horse, Mule, &c.—

Factory Shipments:
Horse and Mule, per keg...$3.00@3.50
Burden's, all sizes.....$3.60
Bryden, Phœnix, Perkins, &c...$3.75..5%
Diamond State, Crescent, &c.,$3.75..10%
Schoenberger.....$3.25

NOTE.—*There is a good deal of unevenness in current prices, whether from manufacturers or jobbers.*

Shot—

Drop, up to B, 25-lb. bag...$1.25@1.35
Drop, up to B, 5-lb. bag ..... .35
Drop, B and larger, 25-lb. bag..... $1.50@1.60
Drop, B and larger, 5-lb bag..... .35
Buck, 25-lb. bag.....$1.50@1.60
Buck, 5-lb. bag ..... .35
Chilled, 25 lb. bag.....$1.50@1.60
Dust Shot, 25-lb. bag.....$2.00@2.10
Dust Shot, 5-lb bag..... ... .50

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, 1st Grade.	*B2, 2d Grade*
Plain Back....	*$10.50*	*$9 60*
Strap Back....	*9.90*	*9 00*
Cleveland Pat'n	*10.20*	*9.30*
	C3, 3d Grade.	*D4, 4th Grade*
Plain Back....	*$8.70*	*$8.10*
Strap Back.....	*8.10*	*7.50*
Cleveland Pat'n	*8.40*	*7.80*

All other sizes add 30c doz.
Black deduct 50c doz.

Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers $0.50@1.00

Shovels and Tongs—

Brass Head.....60&5@60&10%
Iron Head.....60&5@60&10%

Sieves and Sifters—

Hunter's Imitation.gro. $11.00@12.00

Buffalo Metallic Blued, S. S. & Co., ₱ gr.:
14&16 16&18 18&20
$12.90 $13.80 $15.00
Eclipse.....₱ gr. $10.00
Electric Light.....₱ gr. $12.00
Hunter's Genuine.....₱ gr. $12.50
Shaker (Barler's Pat.) Flour Sifters..
₱ doz., $2.00.....95%

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.75@0 80
Mesh 20, Nested, doz..... .85@ .90
Mesh 24, Nested, doz..... 1.00@1.05

Sinks—

Cast Iron—

Standard list.....60@60&10%
NOTE.—*There is not entire uniformity in lists used by jobbers.*

Wrought Steel—

Columbus Galv'd and Enameled..60&5%
Columbus, Painted.....45%

Skeins, Wagon—

Cast Iron.....70@70&10%
Malleable Iron.....40&10@50%
Steel.....35@35&5%
I. I. & B. Co. Steel.....35%

Slates—

"D" Slates.....50&10@50&10&10%
Unexcelled Noiseless Slates.....
60&6 tens@60&6 tens&5%
Wire Bound.....40&10@50%
Double Slates, add $1 case, net.

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $ 2.00.....33⅓%

Snaps, Harness—

German.....40@40&10%
Covert Mfg. Co.:
Derby.....35&2%
High Grade.....45&2%
Jockey.....40&2%
Trojan.....45&2%
Covert's Saddlery Works:
Banner.....60&10%
Crown.....60&10%
Triumph.....60&10%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....45%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid Swivel.....65&1 @65&10&10%
Sargent's Patent Guarded.....
60⅔@60⅔&10%

Snaths—

Scythe.....45&5%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Flat Ware.....50&10@60&10%
Wm. Rogers Mf'g. Co.....50&10%

Miscellaneous—

German Silver.....60&10%
Wm. Rogers Mfg. Co.:
18% German Silver.....60%
Rogers' Silver Metal.....50&10%

Springs—

Door—

Gem (Coil).....30%
Star (Coil).....30%
Torrey's Rod, 39 in....₱ doz. $1.10@1.25
Warner's No. 1, ₱ doz. $1.50; No. 2, $3.40.....55@55&10%
Victor (Coil).....60&10@60&10&5%

Carriage, Wagon, &c.

Factory Shipments.

	Blk.	Hf. Brt.	Brt.
1¼ in. and wider		4¼	4½ 4¾c lb

Cliff's Bolster Springs.....35%
Cliff's Seat Springs.....₱ pair 55¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.....
Steel and Iron.....70@.....%
Rosewood Hdl. Try Square and T-Bevels.....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels.
40&10@40&10&10%
Disston's Try Sq. and T-Bevels....60&10%
Winterbottom's Try and Miter...50&10%

Squeezers—

Lemon—

Wood; Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap.....doz. $2.40@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2 90@3.25
Jennings' Star.....₱ doz. $1.85@1.90
King.....₱ doz. $2.00

Staples—

Barbed Blind.....lb. 8¼@8¼c
Electricians', Association list..75&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting. Staples.....80&10%
Grand Crossing Tack Co.'s list....75&10%

Steels, Butchers'—

Dick's.....40%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%
Nichols Bros.....50%

Steelyards.....25@25&10%

Stocks and Dies—

Blacksmiths'.....40@40&10%
Gardner.....50%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Pike Mfg. Co., list '95-'96.....33⅓%
Cleveland Stone Co., list Nov., '92..33⅓%

Oil Stones, &c.

Pike Mfg. Co.:
Hindostan No. 1, ₱ h...8¢
Sand Stone.....5¢ } 33⅓&
Turkey Oil Stone, Extra, 5 to 9 in.....80¢ } 33⅓&10%
Turkey Slips.....$1.50
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5 in. $2.80
Arkansas Stone, No. 1, 5½ to 8 in. $3.50
39⅓@33⅓&10%
India Oil Stones.....25@33⅓
Tanite Mills:
Emery Oil, ₱ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Milliers Falls.....15&10%
Morrill's...₱ doz., No. 1, $10.00; No. 2, $11.00, 40&20%

Stops, Window—

Ives' Patent.....25&5%
Taplin's.....45%
Wilcox, Steel, per doz., $6.00.....50%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Straps, Box—

Cary's Universal, case lots.....20&10%

Stretchers, Carpet—

Cast Iron, Steel Points ...doz. 55@65c
Cast Steel, Polished.....*doz. $2.25*
Socket.....*doz. $1.75*

Stuffers, Sausage—

Miles' Challenge, ₱ doz. $20...50@50&5%
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks Brads, &c.—

See *Trade Report, List Jan. 15, '99.*
Carpet Tacks, American...90&40@..%
American Cut Tacks.....90&30@..%
Swedes Iron Tacks.....90&20@..%
Swedes Upholsterers' Tacks.....
90&40@..%
Gimp Tacks.....90&40@..%
Lace Tacks.....90&20@..%
Trimmers' Tacks.....90&30@..%
Looking Glass Tacks.....70&10@..%
Bill Posters' and Railroad Tack....
90&30@..%
Hungarian Nails.....80&25@..%
Common and Patent Brads.70&10@..%
Trunk and Clout Nails.....80@..%
NOTE.—*The above prices are for straight Weights.* An extra 5% is given Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Point Tacks....90&10 & 5 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50&10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....60-gal., $4 00
Queen City S. S. & Co., 30-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40&10@50%
Patent Leather.....35@30&5%
Steel.....40@40&5%
Chesterman's.....25@25&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30&5%

Thermometers—

Tin Case.....80@80&10%

Ties, Bale—Steel.

Standard Wire.....50&10&5%

Ties, Wall—

Cleveland, Steel.....₱ 1000, $10.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White.....20@20&5%

Saw—

Atkins' new list.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Oneida Pattern.....70&10@70&10%
Newhouse.....45@50%
Hawley & Norton.....65&5@70%
Victor (Oneida Pattern).....75@75&10%
Star, (Blake Pattern).....65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes.9@10c
Mouse, Round or Square Wire.....
doz. $0.85@1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, ₱ doz. $12.00; case of 24 $10.50
No. 3, Rat, ₱ doz. $5.50; case of 50 $5.00
No. 3½, Rat, ₱ doz. $4.50; case of 72 $4.00
No. 4, Mouse, ₱ doz. $3.50; case of 72 $2.75
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00.....50%
Out o' Sight, Mouse, No. 1, ₱ doz. 60¢; Rat, No. 2, $1.25; Mole, $6.00; Gopher, $1.50; Stop Thief, No. 1, $1.25; No. 2, $1.50.

Fly—

Balloon, Globe or Acme.....
doz. $1.15@1.25; gro. $12.00@14.00
Harper, Champion or Paragon....
doz. $1.25@1.40; gro. $13.50@15.00

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%
Stearns.....25%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.....
gro. $7.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25&10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Daisy Stove Trucks, improved pattern ₱ doz. $21.00
Model Stove Trucks.....₱ doz. $18 50

Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	$5.00	5 50	6.00

Galvanized S. S. & Co., with Wringer Attachment, ₱ doz. No. 10, $7.25 No. 20, $7.75; No. 30.....$8.25

Twine—

Binder—

Carload lots f.o.b. New York, Philadelphia or Boston.

	BC	B.
White Sisal, 500 ft. to lb. per lb.	11	c
Standard, 500 ft. to lb....per lb.	11	c
Manila. 600 ft. to lb .....per lb.	14	c
Pure Manila, 650 ft. to lb per lb	15½	c

Less than carloads add ½¢ per lb.

Miscellaneous—

Flax Twine—	BC	B.
No. 9, ¼ and ½-lb. Balls	22c	26c
No. 12, ¼ and ½-lb Balls	19c	22c
No. 18, ¼ and ½-lb. Balls	16c	19c
No. 24, ¼ and ½-lb. Balls	16c	19c
No 36, ¼ and ½-lb. Balls	15c	18c

Chalk Line, Cotton, ½-lb. Balls.....
18@20c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7@8c
Cotton Wrapping, 5 Balls to lb.....
9@16c
American 2-Ply Hemp, ¼ and ½-lb. Balls.....12@13c
American 3 Ply Hemp, 1-lb. Balls..
12@13c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....10c
India 3-Ply Hemp, 1-lb. Balls.....10c
India 5-Ply Hemp, 1½-lb. Balls....9c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls...
8@9c
Mason Line, Linen, ½-lb. Balls...45c
No. 2½ Mattress, ¼ and ½-lb. Balls.35c
Wool.....7c

Vises—

Solid Box.....50@50&5%
Bonney's Saw Vises.....40&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40&10%
Fisher & Norris Double Screw...15&10%
Hollands'.....40@40&10%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's Clincher.....30@40%
Merrill's.....20%
Miller's Falls.....low list 10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Simpson's Adjustable.....40%
Snediker's X. L.....20@25%
Stephens'.....20@25%
Toles' Woodworking.....25%
Van, W. & W. Hdw. Co.....40%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16 .50&10%
Disston's D 3 Clamp and Guide, ₱ doz $30.....25%
Reading.....40&10%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....30&7½%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%

Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

B. E., 11 up.....60c	Dis. 20&5%
B. E., 9 and 10.....70c	
B. E., 8.....80c	
B. E., 7.....80c	
P. E., 11 up.....$1.00	
P. E., 9 and 10.....1.25	
P. E., 8.....1.50	
P. E., 7.....1.50	
Ely's B. E., 11 and larger..$1.70@1.75	
Ely's P. E., 12 to 20.....$3.00@3.25	

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—
S. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....60@60&7½%
Unground.....65@65&10%
White Enameled Ware:
Maslin Kettles....75&10@75&10&5%
Boilers and Saucepans...55@55&5%
Tinned Boilers and Saucepans.....
55@55&5%
See also *Pots, Glue.*

Enameled—

Agate Nick l Steel Ware, list July '99..35%
Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40&10%
Second Quality, Agate Nickel Steel..65%
Second Quality, Granite.....
70&10@70&10&10%
Iron Clad:
Peppered Ware, high list.....70%
Princess Ware, special list.....33⅓%
Mottled Ware, big list.....75%
Never Break Enameled....50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	6	7	8	9
Each.....	50c	55c	60c	70c

Steel Hollow Ware.

Avery Spiders & Griddles.....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.....
65@65&5%
Never Break Kettles.....60@60&10%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled.....50&5%

Silver Plated Hollow—

William Rogers Mfg. Co.....40&10%

Washboards—

Solid Zinc: ₱ doz
Crescent, family size, bent frame..$3.00
Red Star, laundry size, stationary protector.....$4.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Wilson, family size, bent frame...$2.75
Single Zinc Surface:
Naiad prozector, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.85
Wilson, bent frame family size, ventilated back.....$3 25

Washers—
Leather, Axle—
Solid.....80&10&10@85%
Patent.....85@85&5%
Coil: ⅜ 1 1⅛ 1¼ *Inch.*
11c 12c 13c 15c *per 100*
Iron or Steel
Size bolt ... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.70 4.80 3.50 3.30 3.10
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.
ast W hers
Over ½ inch. barrel lots ....*per lb., 2c*

Washer Cutters—
See *Cutters, Washer.*

Washing Machines—
See *Machines, Washing.*

Water Coolers—
See *Coolers, Water.*

Weaners—
Tyler's N w Ha'ter—No. 1 ₱ doz. $3.45; No. 2, $3.70; No 3, $4.00; No 4 $4 30
Tyler'sSafety—Nos. 1 nd 2, ₱ doz.$1.70; No. 3, $2.00; No. 4, $2.30.

Wedges—
Oil Finish.....*lb.* 4@4¼c
Axe Finish.....*lb.* 4¼@4½c

Weights, Sash—
Eastern prices.....$25.00
Western prices $20.00
NOTE.—*There is a wide difference in prices East and West, and some Foundries are naming lower prices than the above*

Well Buckets, Galvanized
See *Pails, Galvanized.*

Wheels Well—
8-in, $1 75@1.85; *10-in.*, $2.25@2.35; *12-in.*, $2.75@2.85; *14-in.*, $3.25@3.40

Wire and Wire Goods—
Brt. and Ann, 6 *to* 9.....70&10%
Brt. and Ann., 10 to 18.....72½&5%
Brt. and Ann., 19 to 26.....75&7½%
Brt. and Ann., 27 to 36....75&10&2½%
Cop'd and Galv, 6 *to* 9.....66⅔&5%
Cop'd and Galv, 10 *to* 18.....70%
Cop'd and Galv., 19 to 26.....70&10%
Cop'd and Galv., 27 to 36.....72½&5%
Tinned. 6 to 14.....70&10&5%
Tinned, 15 to18 .....70&5&5%
Tinned, 19 to 26.....70%
Tinned. 27 to 36.....65&10%
Annealed Wire on Spools.....60&10&10@70%
Brass and Copper Wire on Spools.....50&10@60%
Brass, list Feb. 26, '96.....20%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £, 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—
Iron and Brass, list July 1, 1899....85&10@85&10&5%

Wire Cloth and Nettin g—
*Galvanized Wire Netting*30&10&5&2%
Painted Screen Cloth per 100ft.....$1.30@1.40
Hardware Grade, Iron:
2 to 20 mesh.....*sq. ft.* 2½@3c
20 x 20 mesh.....*sq. ft.* 3@3½c
Galv Hardware Grade, 2 to 5 mesh...*sq. ft* 3¼@3¾c
Galv. Hardware Grade, 6 to 8 mesh...*sq. ft.* 4@4½c

Wire Barb—See *Trade Repor*

Wire, Ro e—See *Rope, Wire.*

Wrenches—
Agricultural.....70&10@70&10&5%
Baxter's S.....60&10%
Coes' Genuine.....40&10&10%
Coes' "Mechanics".....40&10&10&10%
Acme.....60&10%
Aiken's Pocket (Bright).....$2.00@3.20
Alligator.....60&10&10%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable 'S Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Bindley Automatic.....80%
Boardman's.....33⅓%
Bull Dog, W. & B.....60&10&10%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Hercules.....70%
Solid Handles, P. S. & W.....40&10%
Stevenson.....60&10&10%
Stillson's.....55%

Wrought Goods—
Staples, Hooks, &c., list March 17 '92.....85&5@85&10%

Yokes, Neck—
Covert Saddlery Wo'k's Trimme l.60&5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net

Zinc—
Sheet.....*lb* 6½c@7c

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.
Lead, Foreign white, in Oil.. .. 7¾@ 9¾
Lead, American White, in Oil:
Lots of 500 ℔ or over .... @ 6
Lots less than 500 ℔..... .. @ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price..... .. @ ¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... .. @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.. .. @ 1¼
Lead White, Dry in bbls..... 5½@ 6
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry..... ₱ ℔ 4¼@ 4¾
Zinc, Paris, Red Seal, dry..... .. @ 8¾
Zinc, Paris, Green Seal, dry.... .. @ 9¾
Zinc, Antwerp Red Seal, dry... .. @ 7¾
Zinc, Antwerp, Green seal, dry .. @ 8¾
Zinc, V. M. French, in Poppy Oil, Green Seal,
lots of 1 ton and over..... .. @11¾
lots less than 1 ton..... .. @12
Zinc, V. M French, in Poppy Oil, Red Seal,
lots of 1 ton and over..... .. @10¼
lots of less than 1 ton..... .. @10¾
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon.....₱ ℔ 7 @20
Black, Drop, Amer..... 2½@ 4
Black, Drop, Eug..... 7 @11
Black, Ivory.....15 @21
Lamp, Com..... 3 @ 5
Blue, Celestial.....₱ ℔ 5½@ 8
Blue, Chinese.....35 @40
Blue. Prussian.....30 @38
Blue, Ultramarine..... 3 @35
Brown, Spanish..... ½@ 1
Brown, Vandyke, Amer..... 1¾@ 2½
Brown, Vandyke, Foreign..... 2½@ 3½
Carmine, No. 40..... ...₱ ℔$2.15@2.75
Green, Chrome, ordinary..... 5 @ 6
Green, Chrome, pure.....18 @29
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... .. @ 6
Lots less than 500 ℔..... .. @ 6¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... .. @ 6
Lots less than 500 ℔..... .. @ 6¼
Ocher, French Washed..... 1¾@ 2½
Ocher, Dutch Washed..... 4½@ 5
Ocher, American ... ₱ ton$10.00@15.00
Orange Mineral, English.. ₱ ℔ 9½@12
Orange Mineral, French..... 11½@11½
Orange Mineral, German..... 9½@12
Orange Mineral, American .... 8½@ 8½
Red, Indian, English..... 4½@ 8½
Red, Indian, American ..... 3 @ 3½
Red, Turkey, English..... 4 @ 6
Red, Tuscan. English..... 7 @10
Red, Venetian,Amer., ₱ 100 ℔.. 80@1.10
Red Venetian, English ₱ ℔ .. 1.80@2.10
Sienna, Italian, Burnt and Powdered.....₱ ℔ 3½@ 9½
Sienna, Ital., Raw, Powd..... 3½@ 7½
Sienna, American, Raw..... 1½@ 2
Sienna, American, Burnt and Powdered .....₱ ℔ 1½@ 2
Talc, French.... ....₱ 100 ℔ $1.25 @6.00
Talc, American..... .90 @1.10
Terra Alba, French, ₱ 100 ℔ .. 95 @1.00
Terra Alba, English..... .95 @1.00
Terra Alba, American No. 1....85 @70
Terra Alba, American No. 2....45 @50
Umber, Turkey,Bnt.& Pow.₱ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer..... 1½@ 2
Umber, Raw, Amer..... 1½@ 2
Yellow, Chrome ..... 10½@25
Vermilion, American Lead.....10 @25
Vermilion, Quicksilver, bulk .. @72
Vermilion, Quicksilver, bags..... @73
Vermilion, English, Import.. .80 @95
Vermilion. Chinese.... . ...88 @95

Colors in Oil.
Black, Lampblack..... .... 10 @14
Blue, Chinese..... ..... 36 @40
Blue, Prussian.....32 @36
Blue, Ultramarine.....12 @16
Brown, Vandyke..... 9½@13
Green, Chrome..... 8 @12
Green, Paris..... .. @24
Sienna, Raw..... ...10 @13
Sienna, Burnt..... 10 @13
Umber, Raw ..... 9½@13
Umber, Burnt..... 9½@12

Miscellaneous.
Barytes, Foreign, ₱ ton....$19.00@21.00
Barytes, Amer. floated..... 19.00@20.00
Barytes, Crude..... 9.00@10.00
Chalk, in bulk.....₱ ton 2.15@ 2.35
Chalk, in bbls.....₱ 100 ℔ 35@ 45
China Clay, English, ₱ ton 12.00@17.50
Cobalt, Oxide.....₱ 100 ℔ 2.20@ 2.50
Whiting, Common.₱ 100 ℔. .42@ .52
Whiting, Gilders..... .54@ .64
Whiting, extra Gilders'.... .58@ .68

Putty.
In bulk..... ...$1.90
In bladders 2.40
In cans, 12 ℔ to 25 ℔..... 3.50
In cans, 1 ℔ to 5 ℔..... 3.60

Spirits Turpentine.
In Southern bbls..... .. @46½¢
In machine bbls .... @47 ¢

Glue.
Low Grade.....₱ ℔13 @15
Cabinet.....13 @16
Medium White.....14 @16
Extra White.....16 @25
French.....12 @25
Irish.....13 @15

Animal, Fish and Vegetable Oils.
Linseed, City, raw.....₱ gal.65 @66
Linseed, City, boiled.....67 @68
Linseed, Stra'ts and West'n, raw .. @64
Linseed raw Calcutta seed..... @76
Lard, Prime ..... 56 @58
Lard, Extra No. 1..... 48 @50
Lard. No. 1..... 41 @43
Cotton-seed, Crude..... 33 @34
Cotton-seed, Summer Yellow, prime..... 36½@38
Cotton-seed Summer Yellow, off grades..... 36 @36½
Sperm, Crude..... .. @ ..
Sperm, Natural Spring..... .. @ ..
Sperm, Bleached Spring..... .. @ ..
Sperm, Natural Winter..... 57 @ .
Sperm, Bleached Winter..... 62 @ ..
Whale, Crude..... 38 @ ..
Whale, Natural Winter..... .. @47
Whale, Bleached Winter..... .. @49
Menhaden, Crude, Sound..... 25 @ ..
Menhaden, Light Straw'ed..... 29 @30
Menhaden, Bleached Winter...35 @ ..
Menhaden, Extra Bleached..... .. @37
Tallow, prime..... 53 @54
Cocoanut, Ceylon..... 5½@ 5¾
Cocoanut, Cochin..... 6 @ 6¼
Cod, Domestic..... 30 @33
Cod, Newfoundland..... 36 @38
Red Elaine..... 34 @36
Red Saponified.....₱ ℔ 5 @ ..
Olive, Italian, bbls..... 57 @60
Neatsfoot, prime..... 48 @50
Palm, prime, Lagos.....₱ ℔ 6 @ 6¼

Mineral Oils.
Black, 30 gravity, 25@30 cold test.....₱ gal. 9¼@10¼
Black, 29 gravity, 15 cold test. 10¼@11¼
Black, summer..... 9¼@ 9¾
Cylinder, light filtered..... 14¾@17¾
Cylinder, dark filtered..... 11¾@16¼
Paraffine. 903-907 gravity..... 14¾@15¼
Paraffine, 903 gravity..... 13¾@14¼
Paraffine, 883 gravity..... 12¼@12¾
Paraffine, red, No. 1..... 14¼@15¼
In small lots ½¢ advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

RATES OF SUBSCRIPTION: INCLUDING POSTAGE.

UNITED STATES AND BRITISH AMERICA.

Regular Edition, Issued every THURSDAY morning, - - - - - - - - - - $5.00 a year.
Two Dollar Edition, large number FIRST and THIRD THURSDAYS of every month, Bulletin number each intervening Thursday, 2.00 "
Dollar Edition, large number FIRST THURSDAY of every month, Bulletin number each intervening Thursday, - - 1.00 "

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THREE MONTHS, - - - - - - -	26.25	Rates for larger spaces quoted on application.	

New York (Main Office), - - 232-238 William Street, - - - - - - - - DAVID WILLIAMS CO., Pub'rs.
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Pittsburgh, - - - - - - - Hamilton Building, 335-337 Fifth Avenue, - - ROBERT A. WALKER, Manager.
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BRITISH AGENCY: Office of *The Ironmonger*, 42 Cannon Street, London.
AUSTRALIAN OFFICES: Melbourne, Hardware Chambers, 231 Elizabeth Street; Sydney, Palings Buildings

Remittances should be made by draft, payable to the order of DAVID WILLIAMS COMPANY, on any banking house in the United States or Europe, or by P. O. Money Order on New York. When these cannot be obtained, postage stamps of any country will be received.
Newsdealers or Booksellers in any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.: The International News Company, New York, U. S. A., and London, England; or The San Francisco News Company, San Francisco, Cal., U. S. A.

Entered at the Post Office, New York, as Second-class Matter.

CURRENT METAL PRICES.

JULY 11, 1900.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ lb; Square, 0.8¢ ₩ lb
1 to 1⅞ in. round and square; 1⅛ to 4 in. x ⅜ to 1 in. ₩ lb 2.00@2.10¢
Refined Iron:
1 to 1⅞ in. round and square; 1⅛ to 4 in. x ⅛ to 1 in. ₩ lb 2.10@2.20¢
1⅛ to 4 in. x ¼ to 5-16 ₩ lb 2.30@2.40¢
Rods—⅜ and 11-16 round and square. ₩ lb 2.30@2.40¢

Angles:	Cts ₩ lb
3 in x ¼ in. and larger	2.50¢
3 to 3½ in. x 3-16 in.	2.50¢
1½ to 3 in. x ⅛ in.	2.60¢
1½ to 2¾ in. x 3-16 in and thicker	2.50¢
1 to 1¼ in. x 3-16 in.	2.60¢
1 to 1¼ x ⅛ in.	2.70¢
⅞ x ⅛ in.	3.25¢
⅝ x ⅛ in.	3.25¢
⅝ x ⅛ in.	4.30¢
½ x 3-32 in.	4.80¢
Tees:	
1 in.	3.00¢
1¼ to 2¾ in.	2.75¢
3 in. and larger	2.75¢
Beams	3.00¢
Channels, 3 in. and larger	3.00¢
Bands—1½ to 6 x 3-16 to No. 8	₩ lb 2.80¢
"Burden's Best" Iron, base price	₩ lb 3.60¢
Purden's "H. B. & S. Iron, base price	₩ lb 3.40¢
"Ulster"	₩ lb 3.60¢
Norway Bars	4¼@4¾¢
Norway Shapes	4½@5 ¢

Merchant Steel from Store—

	per lb
Open Hearth and Bessemer Machinery	2.30 to 2.40¢
Toe Calk, Tire and Sleigh Shoe	3.75@4.00¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	6 ¢

Soft Steel Sheets—

¼ inch	2.90¢	No. 14	2.90¢
3-16 inch	2.85¢	No. 16	3.00¢
No. 8	2.80¢	No. 18	3.10¢
No. 10	2.80¢	No. 20	3.20¢
No. 12	2.85¢	No. 22	3.30¢

Sheet Iron from Store.

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 3.35	3.35¢
Nos. 17 to 21	₩ lb, 3.40	3.45¢
Nos. 22 to 24	₩ lb, 3.45	3.55¢
Nos. 25 and 26	₩ lb, 3.50	3.60¢
No. 27	₩ lb, 3.55	3.65¢
No. 28	₩ lb, 3.60	3.75¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 10½¢
Patent Planished ₩ lb A, 10½¢; B, 9½¢, net.

Galvanized.

	B. B.
Nos. 10 to 16	₩ lb, 12¢
Nos. 17 to 21	₩ lb, 13¢
Nos. 22 to 24	₩ lb, 14¢
Nos. 25 to 26	₩ lb, 15¢
No. 27	₩ lb, 16¢
No. 28	₩ lb, 17¢
No. 29	₩ lb, 19¢
No. 30	₩ lb, 21¢

70@70&2½% off

36 in. 1¢ ₩ lb higher.

Foreign Steel from Store—

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 18 @ 20 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 13 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12 ¢
R. Mushet's "Special"	₩ lb 46 ¢
" " " Annealed	₩ lb 75 ¢
" " "Titanic"	₩ lb 19 ¢
Hobson's Choice XX Extra Best	₩ lb 35 ¢
Jessop Self Hardening	₩ lb 45 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson's "Soho" Special Self-Hardening	₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.

	Per lb
Banca, Pigs	32½@33¢
Straits, Pigs	31½@32¢
Straits in Bars	32½@33¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$7.50
IX, 14 x 20	9 00
Melyn Grade:	
IC, 14 x 20	7.00
IX, 14 x 20	8.50
Allaway Grade:	
IC, 14 x 20	6.15
IX, 14 x 20	7.25

American Coke Plates—Bessemer—

IC, 14 x 20 108 lb	$5.30@5.40
IX, 14 x 20	6.25@6.30
IXX, 14 x 20	7.50@7.60

American Terne Plates—

IC, 20 x 28	$10.50
IX, 20 x 28	12.50

Tin Boiler Plates, American—

IXX, 14 x 28 112 sheets	$13.00
IXX, 14 x 28 112 sheets	14.00
IXX, 14 x 31 112 sheets	15.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	17¾¢
Ansonia grade Casting	17½¢

Sheet and Bolt—

January 19, 1900. Prices, in cents per pound. Sheet 30 x 60. Net.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7¾ to 9½ lb.	8 oz. and 9 oz. 6¾ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20½	20½	20½	20½	21½	23½	23½	26½	29½
30	96	72	20½	20½	20½	20½	21½	23½	26½	29½	
30	.....	96	20½	20½	20½	20½	22½	26½			
36	72	.....	20½	20½	20½	20½	22½	24½	27½	30½	
36	96	72	20½	20½	20½	22½	22½	26½	29½		
36	120	96	20½	20½	20½	22½	23½				
36	.....	120	20½	20½	21½	22½					
48	72	.....	20½	20½	21½	22½	24½	27½	30½		
48	96	72	20½	20½	21½	23½	25½	28½			
48	120	96	20½	20½	22½	24½	28½				
48	.....	120	20½	21½	23½	26½					
60	72	.....	20½	21½	21½	23½	26½	31½			
60	96	72	20½	20½	22½	24½	29½				
60	120	96	20½	21½	23½	26½					
60	.....	120	20½	22½	24½	28½					
72	96	.....	20½	21½	23½	28½					
72	144	96	20½	22½	25½	30½					
72	.....	144	21½	23½	28½						
108	120	.....	21½	23½	29½						
108	.....	120	23½	24½							
wider than 108	144	.....	24½	26½							
	.....	144	25½	28½							

Bolt Copper, ⅜ inch diameter and over, ₩ lb 20½¢
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under, 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb	24½¢
12 oz. and up to 14 oz. to square foot, ₩ lb	25½¢
10 oz. and up to 12 oz., ₩ lb	27½¢
Lighter than 10 oz., ₩ lb	30½¢

Circles less than 8 in. diameter, 2¢ ₩ lb additional.
Circles over 13 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

Last March 2, 1900.

Nos.	0000 to 8	9 and 10		11 and 12	
	Base	½¢		½¢ ₩ lb adv.	
Nos.	13	14	15	16	
	¾¢	¾¢	1¢	1½¢ ₩ lb adv.	
Nos.	17	18	19	20	
	1½¢	2¢	2½¢	2½¢ ₩ lb adv.	

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	...	.....	...	.....	33	31	30	29	28	27	25	24
12	10	...	.....	37	35	33	31	30	29	28	27	25	24
13	11	...	.....	37	35	33	31	30	29	28	27	25	24
14	12	...	41	37	35	33	31	30	29	28	27	25	24
15	13	...	42	38	36	33	32	31	30	30	28	26	25
16	14	...	43	39	37	34	33	32	31	30	29	26	25
17	15	...	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Feb. 26 1896
Brown & Sharpe's gauge standard.

				Per lb.
Plain Round Tube, ¾ in. up to 2 in.				$0.35
"	"	⅞	"	.36
"	"	¹⅞	"	.28
"	"	1⅛	"	.41
"	"	5-16	"	.48
"	"	¼	5-16"	.65
"	"	3-16	¼ "	1.00
"	"	⅛	3-16"	1.50
Smaller than ¼ inch				Special
¾ inch and larger				.40
Over ¾ inch to 3½ inch, inclusive				.45
Over 3½ inch				.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 35%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	2 12	12 14	14 16	16 18	18 20	20 22	22 24	24 26	
To No. 20, inclusive	.22	.23	.25	.27	.29	.31	.33	.36	
Nos. 21, 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37	
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38	
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39	

Common High Brass	in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	26 28	28 30	30 32	32 34	34 36	36 38	38 40	40
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add ½¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 20%

Wire in Coils.

List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gild'g bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 20%; Copper Wire, Net.
List November 16, '96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net 20¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net 21¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb

Western Spelter 4¾@5 ¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

600 lb casks 7¢ | Per lb 7¾¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 3½¢ ₩ lb.

American Pig	4⅜@4½¢
Bar	4½@5 ¢
Pipe (full lengths), subject to discount 20%	6¢
Pipe (cut lengths), subject to discount 20%	6½¢
Tin Lined Pipe, subject to discount 20%	12½¢
Block Tin Pipe, subject to discount 20%	42½¢
Sheet (full rolls) subject to discount 20%	7¢
Sheet (cut rolls (subject to discount 20%	7½¢
Old Lead in exchange, 3½¢ ₩ lb.	

Solder.

½ & ½, guaranteed 19@20¢
No. 1 15½@17½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ½¢ ₩ lb.

Cookson	₩ lb 11½
Hallett's	₩ lb 10½
U. S.	₩ lb 10½¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting:	
Small lots	₩ lb 37¢
100-lb lots	₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots	₩ lb 34¢
100-lb lots	₩ lb 33¢

Aluminum Sheet, B. & S. gauge. 50 lb or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40½¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41 ¢	No. 18	₩ lb 55¢
No. 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 42 ¢	No. 20	₩ lb 65¢
No. 14	₩ lb 42½¢	No. 21	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 13½¢
Light and Tinned Copper	₩ lb 12½¢
Heavy Brass	₩ lb 9 ¢
Light Brass	₩ lb 7½¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 3 ¢
No. 1 Pewter	₩ lb 17 ¢
No. 2 Pewter	₩ lb 9½¢
Tin Plate Scrap	₩ ton $6.00
Wrought Scrap Iron	₩ gross ton $10.00@11.00
Heavy Cast Scrap	₩ gross ton $10 00@11.00
Stove Plate Scrap	₩ gross ton $7.00@ 7.25
Burnt Iron	₩ gross ton $6.25@ 6.50

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BOX STRAPPING.

MADE IN VARIOUS WIDTHS.

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BECAUSE the largest consumers acknowledge the Superior quality of our

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and all kinds of old Metals. Write for prices to

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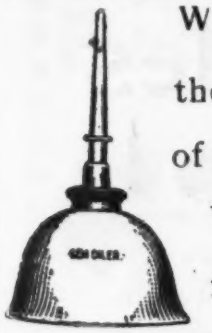
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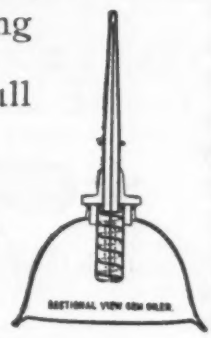
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$ .55	.60	.65	.70	.85	.95	1.05 per doz.
6	7	8	9	10	11	12 inch.

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Empire Door Holder.



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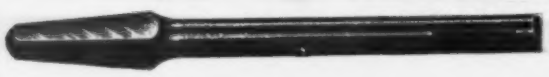
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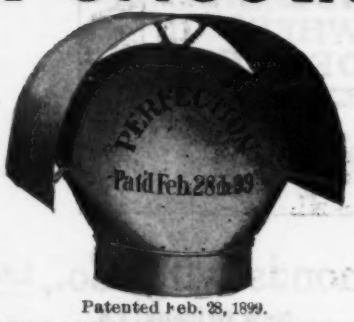
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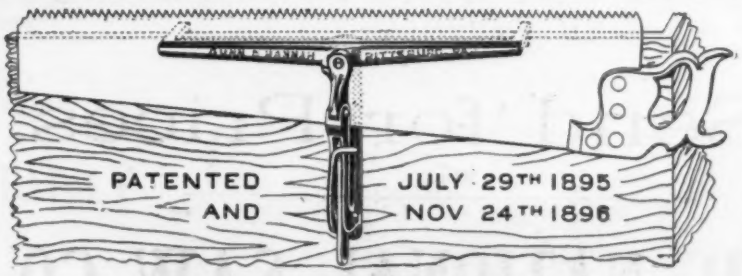
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A GREAT LABOR SAVER.

Does the work of five men.
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Lawn Mower

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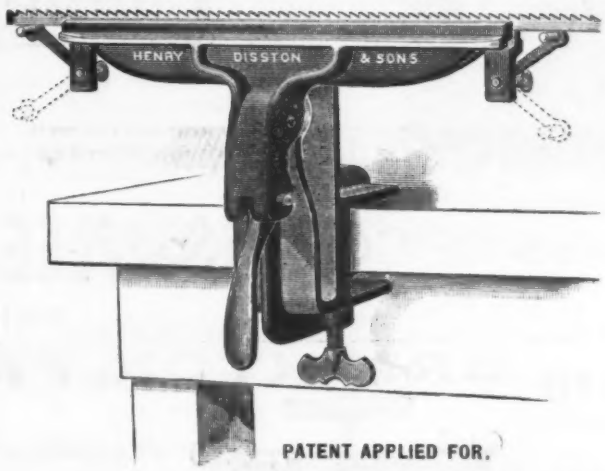
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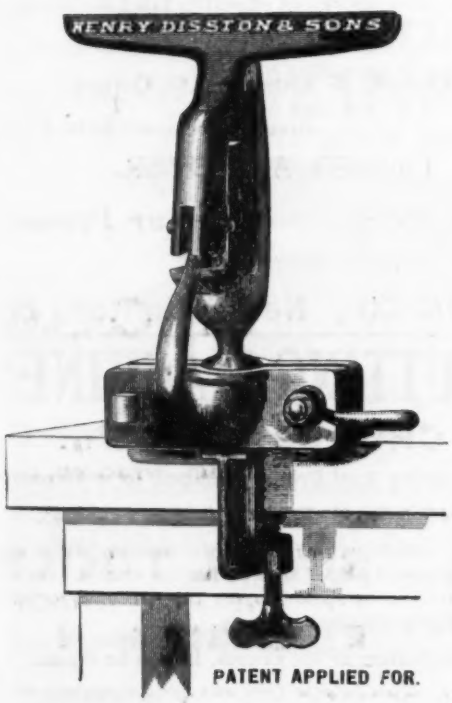
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This Clamp is now made with a Lever Tightener, so arranged as to hold the saw blade firmly in position whilst permitting its instant release by a slight movement of the Lever.

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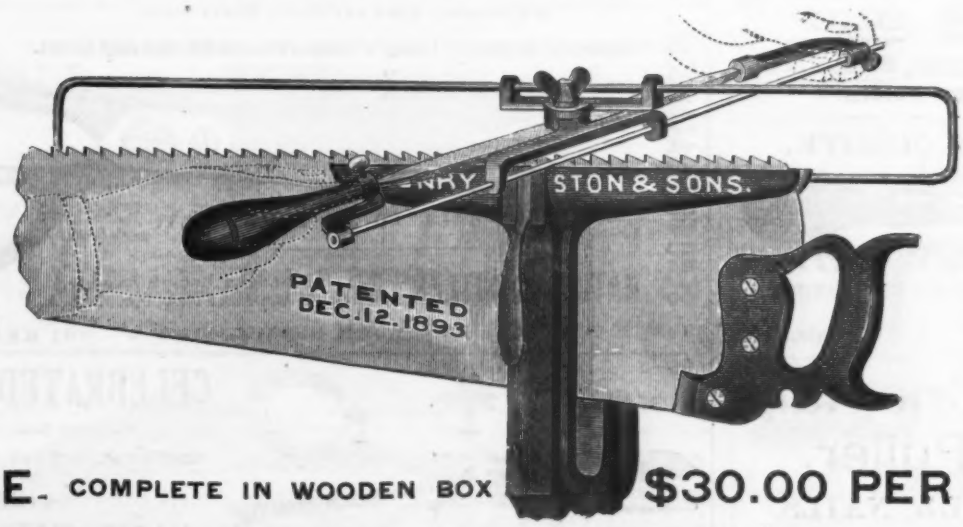
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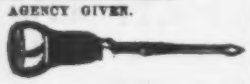
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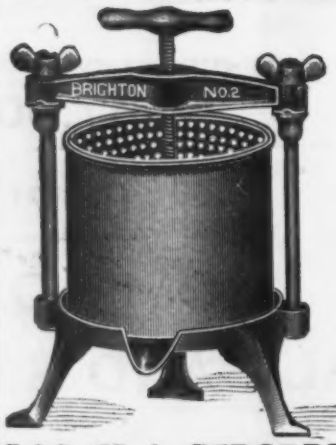
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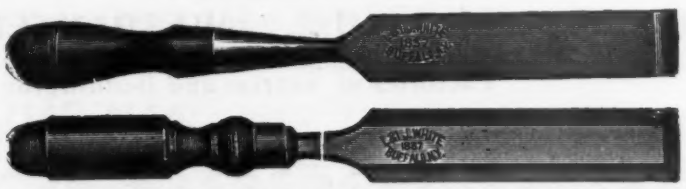
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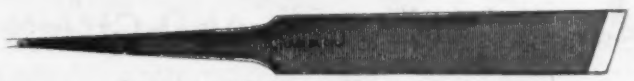
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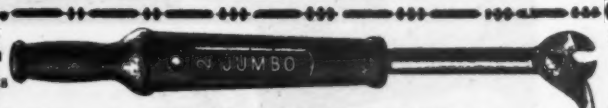
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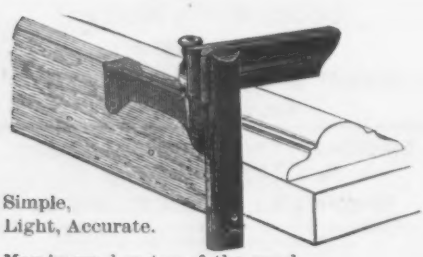
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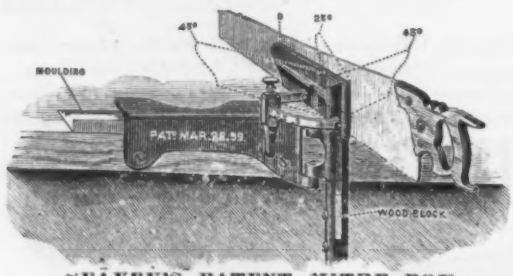
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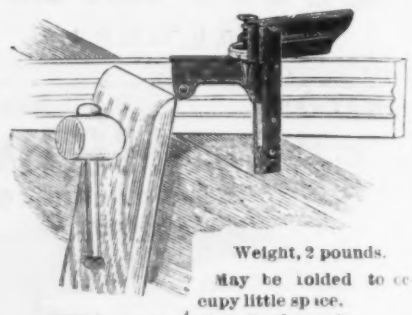


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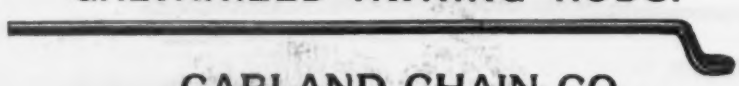
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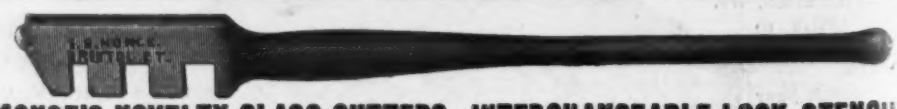
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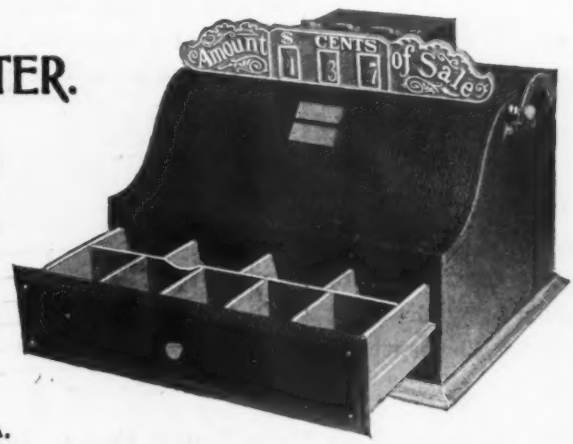
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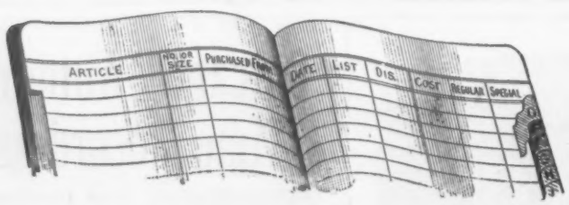
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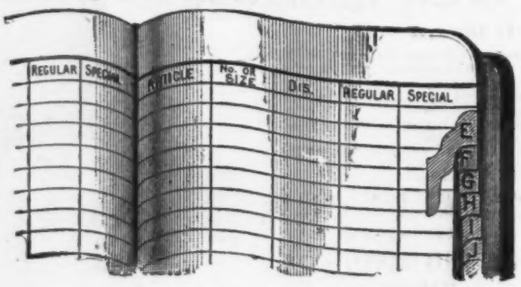
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The ice may be prevented from scattering by covering with a coarse cloth.
Breaker is completely galvanized.
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VAN DORN'S Steel Joist Hanger



HAS NO EQUAL

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STRUCTURAL STEEL AND ORNAMENTAL IRON WORKERS

Washing Machines,

CYCLONE CHURNS, SELF-MEASURING OIL PUMPS.



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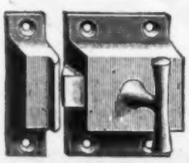
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Hardware Chain, Ship Chain, Railroad Chain.

High Grade Chain of all kinds.

PROMPT SHIPMENTS.

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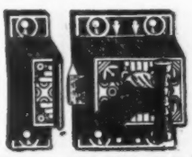
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Low Prices. Quick Delivery.

Write for Catalogue and Price List. Our prices will warrant you in sending us your business

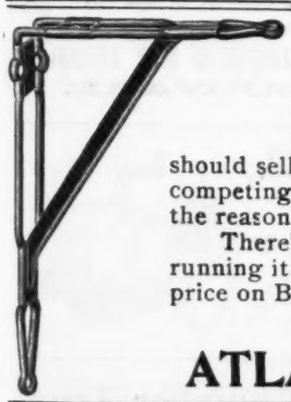


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Improved Carpenters' Tools.

SOLD BY ALL HARDWARE DEALERS.



WE ADMIT

that it costs somewhat less to make the Bradley Shelf Bracket than any of the other steel brackets now on the market. ***We don't admit*** that this is any reason why we should sell it for less. The goods are equally as strong, well finished and attractive as any competing goods, but we are not going to argue the matter; ***we do sell them for less,*** and the reason is that it is money in our pocket to do so.

There's no money in automatic machinery unless it is kept running, and when it is kept running it turns out a mighty big lot of goods. ***That's the reason*** for the uniformly low price on Bradley Brackets.

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Manufacturers of **Pressed and Stamped Steel Ware Specialties.** Sole makers of the **Eclipse Brand Curry Combs,** made of the Finest Cold Rolled Steel, in great variety of styles and sizes, and of superior quality and finish, and salable in all the markets of the world; also makers of Fine Polished Steel Cooking Utensils, including the **Famous Acme Frying Pans.** Catalogue free on application.



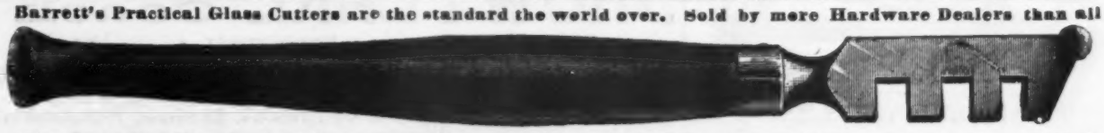
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BITS.

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Barrett's Practical Glass Cutters are the standard the world over. Sold by more Hardware Dealers than all other makes combined. Send for prices and sample. W. L. BARRETT, Manufacturer, Bristol, Conn., U. S. A.



The MILBRANT ROLLING STEP LADDERS



have the highest recommendation from thousands of customers. They are the handsomest and easiest-running ladders made; work noiselessly, and are absolutely safe and durable. Ladders are made to order and to fit all kinds of shelving, in various styles, to suit all purposes.

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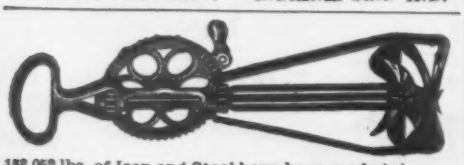
Made of Wood. No screws or nails used to work out and cut your shelving.

Look the matter up. Descriptive circular with list of references and prices mailed on request. We also make a general line of Paper Boxes.
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LIVE HARDWARE MEN USE
PERFECT SHELF BOXES
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FREE SAMPLES
of this wonderful Metal Polish will be sent to any one for the asking. It is guaranteed free from grit and acid and not to mar the most delicate surfaces Cheaper and better than any other
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133,052 lbs. of Iron and Steel have been made into Lyon Egg Beaters and Cream Whips. Send for New Price-List Circular.
Nelson Lyon, Sole Manuf., 52 Green St., Albany, N. Y.

THE BICYCLE STEP LADDER.
Especially adapted for Hardware Stores.



The newest, neatest, simplest, easiest operated and safest store ladder made. Highest Award World's Fair. Write us. THE BICYCLE STEP LADDER CO., 65 Randolph St., Chicago, Ills.
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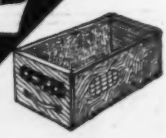


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MORLEY BROTHERS,
123 SOUTH TILDEN STREET, SAGINAW, MICH.

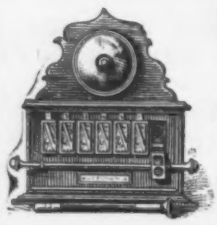
STEEL HARDWARE SHELF BOXES



ANY SIZE TO FIT YOUR SHELVING.
SEND FOR CATALOGUE.
HELLER BOX CO.
MONTCLAIR, N.J. U.S.A.

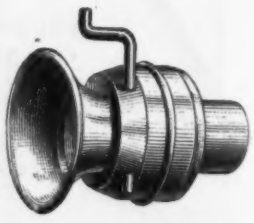
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IN STOCK AND FOR SALE BY
W. & J. TIEBOUT,
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MANUFACTURERS OF
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Manufacturers of
Speaking Tubes, Whistles, Oral, Electric, Mechanical and Pneumatic Annunciators and Bells.
Complete outfits of Speaking Tubes, Whistles, Electric, Mechanical, and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, N. Y.



Brown's Patent, Seamless, Oil Chamber Truss and Clip Bar Skeins.

The Best Cast Iron Skein in the World. Interchangeable with D. V. & Co and Anderson Truss.



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Manufactured by
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There is not another line of tapes in the market that will equal ours in quality, accuracy, workmanship, neatness and every other way.

LUFKIN RULE CO., SAGINAW, MICH., U. S. A.

New York City Office and Store, - 291 STEWART BUILDING.

A SUPERIOR LINE OF PRICE CARDS FOR THE HARDWARE STORE IS NOW OFFERED IN

The Iron Age Brass Bound Price Cards.

These cards, nine in number, are of various sizes, suitable for more or less extended lines of goods and for use in different parts of the store. The cards are designed to resist long and hard usage, being well made, of stiff card-board, mounted on both sides with Crane's Bond Paper. They have a neat and substantial brass binding, and are provided with a brass eyelet for hanging.

BELTING

ARTICLE	No. of Size	Retail	Special	Cost	List
	1"	.07	.06½	.01½	.14
	1½"	.09½	.08½	.01¾	.19
Leather	1¾"	.12	.10½	.02	.24
	2"	14½	.13	.02½	.29
List of	2½"	.17	.15½	.03½	.34
May 15th 99	2¾"	.19½	.17½	.03	.39
Manufacturers	3"	.21½	.19½	.03½	.43
Association	3½"	.24	.22	.04½	.48
	3½"	.26½	.24	.05	.53
"Hoyt"	4"	.31½	.28	.05½	.63
Reg. Short Lap.	4"	.36	.33	.06½	.72
Discount	4½"	.41	.37	.07½	.82
25 + 10 %	5"	.46	.42	.07½	.91
Delivered	5½"	.50	.45	.08	1.01
Doubles	6"	.55	.50	.09	1.11
Double price	7"	.65	.59	.10½	1.30
of Single.	8"	.74	.67	.11½	1.48
	9"	.83	.75	.13½	1.67
	10"	.93	.84	.14	1.85
	12"	1.11	1.00	.17½	2.22
	14"	1.30	1.17	.19½	2.59

This cut shows, in reduced size, one of the uses for which Price Card No. 100 may be employed. The word Belting is cut from the Price Card Pasters.

No.	Size, inches.	Price each.
100.....	4 x 8 with Column Headings	$0.15
101.....	4 x 16 with Column Headings	.25
102.....	4 x 13 with Column Headings	.20
103.....	3 x 7 with Column Headings	.10
104.....	7 x 4 with Column Headings	.15
105.....	11 x 8 without Headings	.25
106.....	8 x 12 with Column Headings	.30
107.....	5 x 4 with Column Headings	.10
108.....	10 x 12 without Headings	.35

All these Price Cards are furnished with blank space at top for name of article, for which The Iron Age Hardware Price Card Pasters are provided.

REELS	SCISSORS	SIEVES
REFRIGERATORS	SCOOPS	SIFTERS
REGISTERS	SCRAPERS	SKATES
RIDDLES	SCREEN WIRE	SKEINS
RINGERS	SCREENS	
RINGS RINGS	SCREWS SCREWS	
RIVETS AND BURRS	SCREWS SCREWS	

A section of The Iron Age Hardware Price Card Pasters, reduced size. Printed on gummed paper.

Full Size Pasters.

Price, 25 cts.

RIVETS

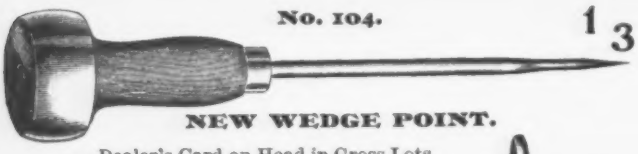
ARTICLE	No. of Size	Retail	Special	Cost	List
Tinners	8 oz.	12¢	10¢	.11	.20
Iron	10 "	.13	.11	.11½	.22
Black	12 "	.14	.12	.12½	.24
1000	14 "	.15	.13	.13½	.26
Pkgs	1 lb	.16	.14	.13½	.27
	1¼ "	.17	.15	.14½	.29
List	1½ "	.19	.17	.15½	.33
May 10th	1¾ "	.21	.19	.17½	.37
1899	2 "	.23	.21	.19½	.42
	2½ "	.30	.28	.26½	.55
	3 "	.33	.30	.27	.60
Cost	4 "	.42	.38	.35½	.76
25 & 10 %	5 "	.50	.45	.41	.90
from	6 "	.60	.54	.49½	1.08
List	7 "	.70	.63	.57½	1.26
	8 "	.80	.72	.65½	1.44
	9 "	.85	.77	.70	1.53
	10 "	.95	.88	.80½	1.76
	12 "	1.10	1.00	.91	1.98

This reduced size cut shows a method of using Card No. 103 for Rivets, the name of the article being clipped from the Price Card Pasters.

SEND FOR OUR EIGHT-PAGE ILLUSTRATED CIRCULAR.

This circular offers excellent suggestions regarding the use of Price Cards, showing methods of progressive hardwaremen in recording prices.

DAVID WILLIAMS COMPANY, Publishers, 232-238 William St., N. Y.

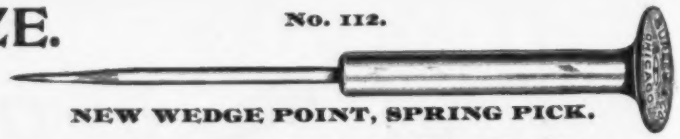


No. 104.

NEW WEDGE POINT.

Dealer's Card on Head in Gross Lots.

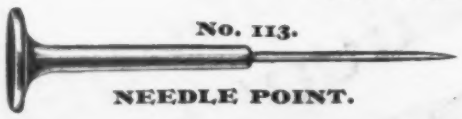
1/3 SIZE.



No. 112.

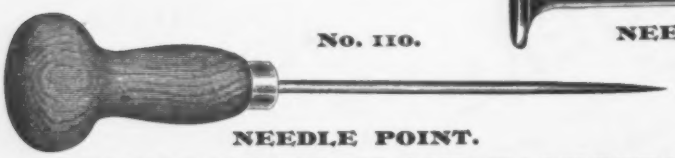
NEW WEDGE POINT, SPRING PICK.

Dealer's Card on Head in Gross Lots.



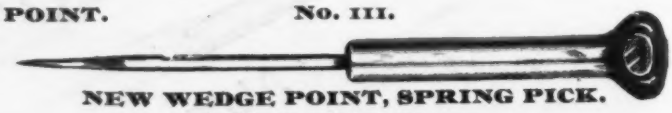
No. 113.

NEEDLE POINT.



No. 110.

NEEDLE POINT.



No. 111.

NEW WEDGE POINT, SPRING PICK.

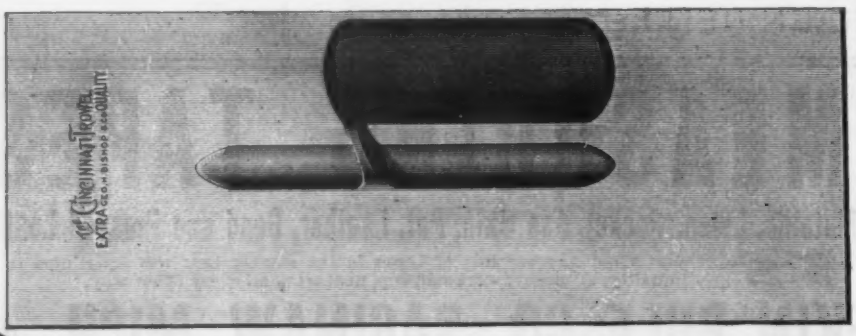
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WALKER'S QUICK AND EASY ICE PICKS. ANTI-RUST NICKEL-PLATED.

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THE ONLY CINCINNATI TROWEL



WARRANTED TO BE THE BEST. MADE FROM THE FINEST STEEL. GUARANTEED TO OUTLAST ANY OTHER SIMILAR TOOL.

Try a lot and see how easily they're sold.

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Salaried Eastern and Export Representatives.

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D. M. STEWARD MFG. CO.

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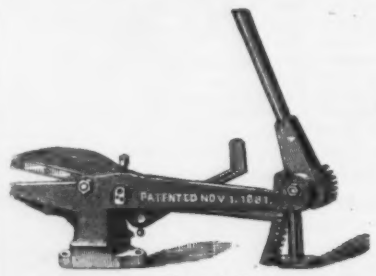


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ball bearing grindstone runs as easy as a bicycle. All parts are made from steel, and will last a lifetime. The stones are the best obtainable. When folded and crated they occupy but little space. With the Velox one man does the work of two. If your jobber does not handle them, write to us.

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"Eureka" Patent Shear.



Patented.

The most effective implement for cutting wire rods and strip metal.

Should be kept in stock by every hardware dealer.

SIMPLE. DURABLE. STRONG. CHEAP.

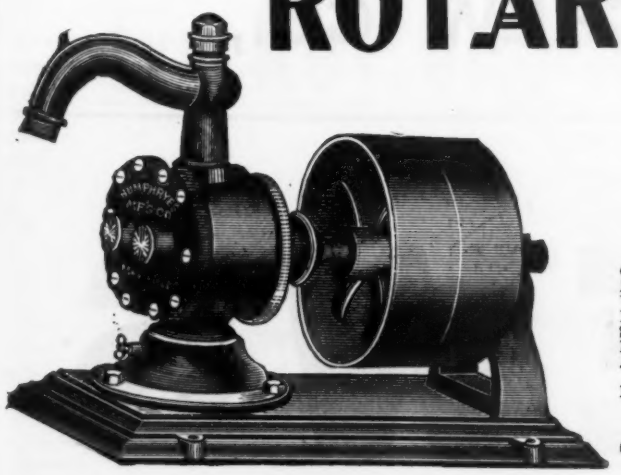
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WE MAKE THESE FOR PUMPING COLD OR HOT WATER, OIL, BEER AND ACIDS. Write for Prices.

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WE ALSO MAKE

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This system is used extensively in this country and under the direction U. S. Military Government abroad.

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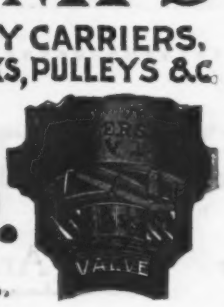
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Iron Hand and Wind Mill.

SINGLE and DOUBLE ACTING PUMPS for all purposes.

CAST IRON SINKS, SINK BRACKETS.

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STAR WIND MILLS,

All Kinds and Sizes.

"Hoosier" and "Fast Mail" Iron Pumps.

Secure the Agency for 1900.

Galvanized Steel Star Back Geared Wind Mills.
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Estimates and advice furnished on *Steel Sub-Structure* work of all kinds.

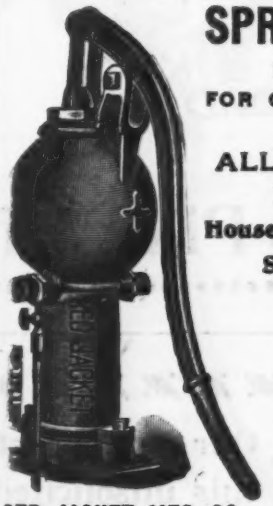
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IS THE BEST FOR GENERAL USE.

WE MAKE

ALL KINDS OF PUMPS,

House Force,
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SCREWS

MANUFACTURERS OF
SCREWS, TIRE BOLTS, STOVE BOLTS, RIVETS AND BURRS, WIRE NAILS AND - - - -

KINDRED ARTICLES IN ALL VARIETIES OF FORM AND FINISH, BOTH REGULAR AND SPECIAL.

PROVIDENCE, R. I., U. S. A.

Sharpening Stones!



India, Arkansas, and Washita OILSTONES,
Black Diamond, White Mountain, and Indian
Pond SCYTHESTONES are the Best

... ASK FOR THEM ...

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Our No. 600 style of hangers for Folding Partitions—no pocket.

Read this unsolicited testimonial:

"As is the case with ALL Coburn Hangers the No. 600 Style are giving excellent satisfaction and we are getting new trade on them."

We make only the best door hangers.

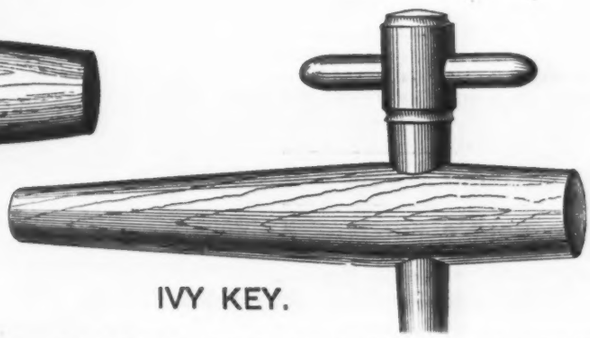
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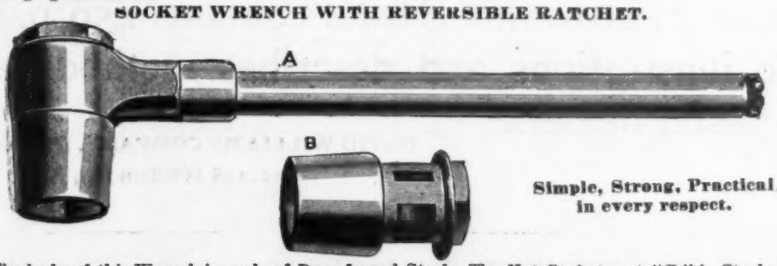
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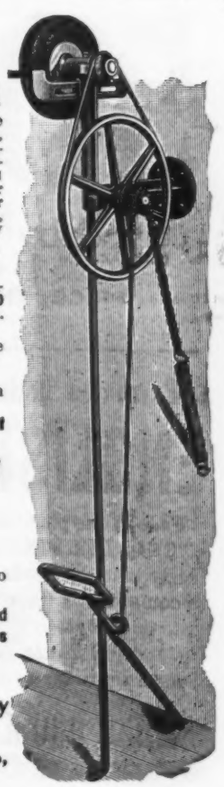
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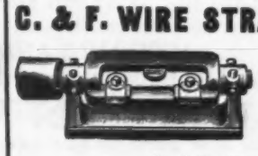
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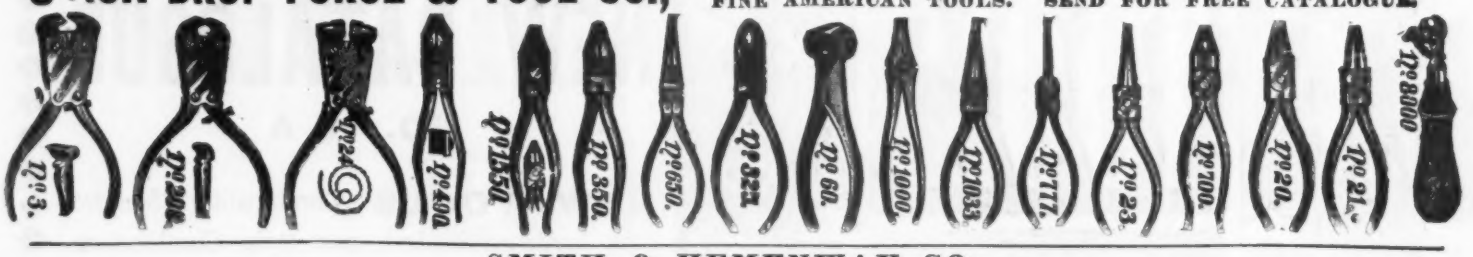


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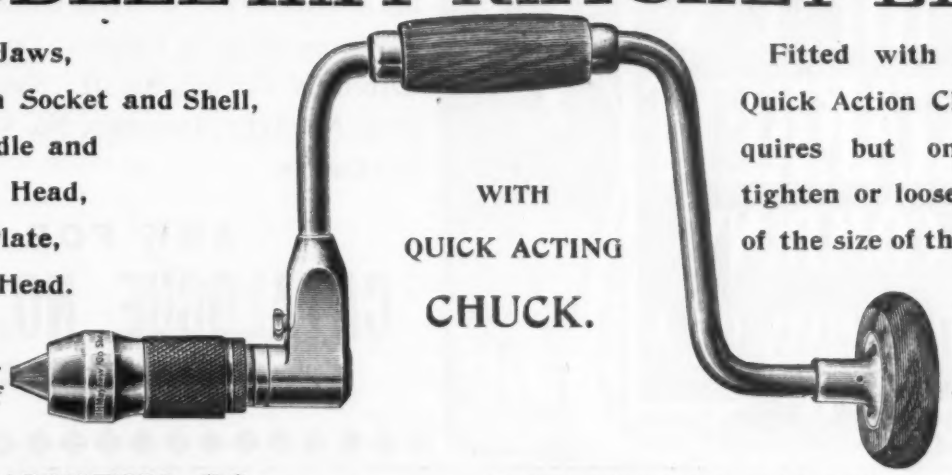
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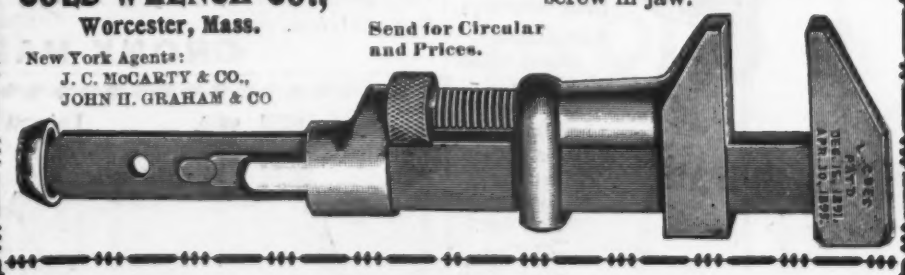
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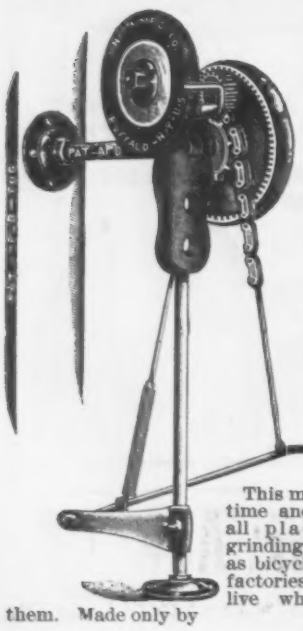
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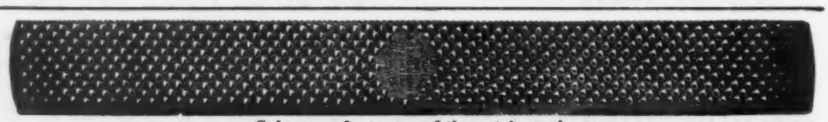
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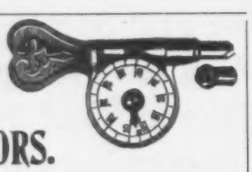
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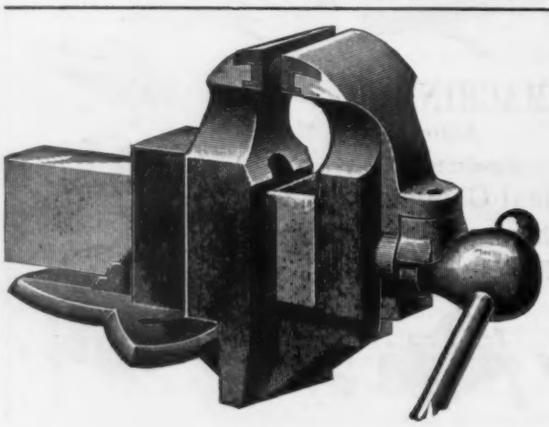
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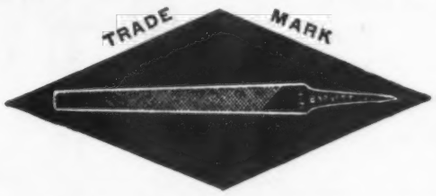
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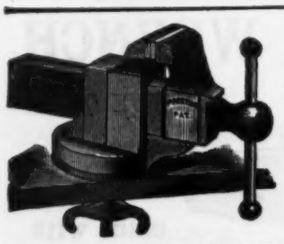


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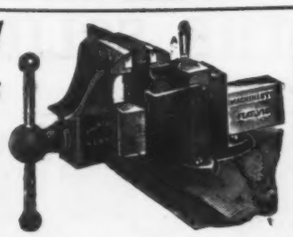
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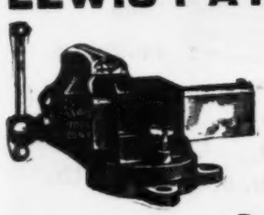


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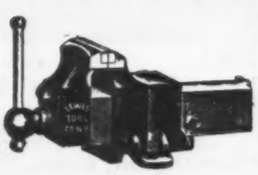
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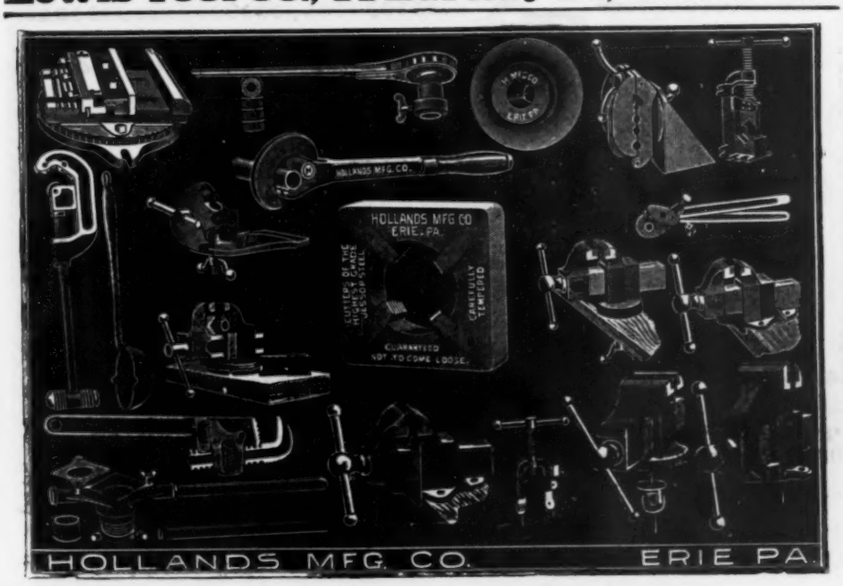
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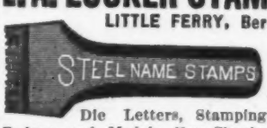


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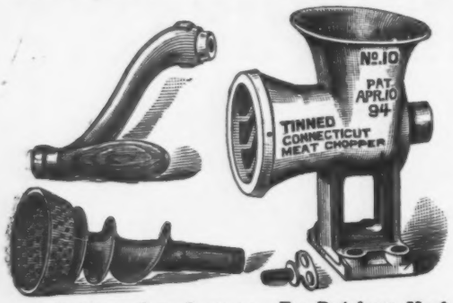
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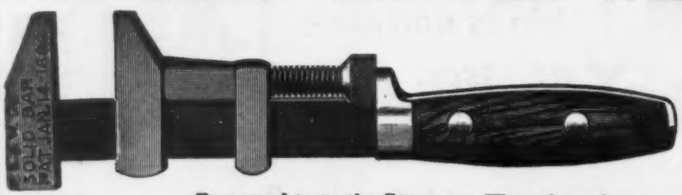
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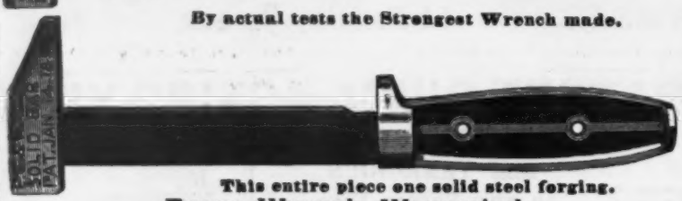
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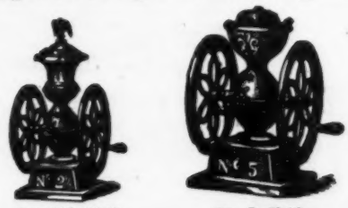


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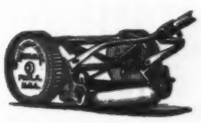
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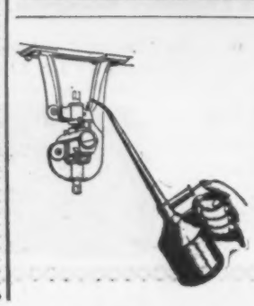
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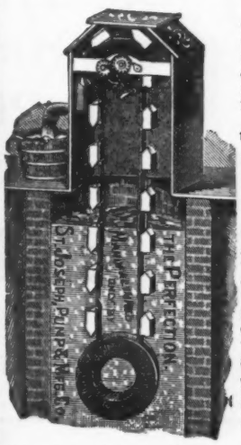
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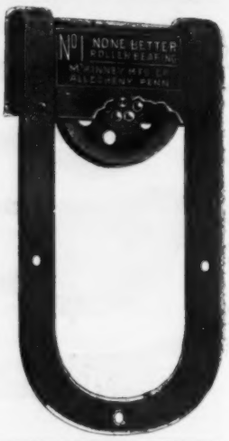
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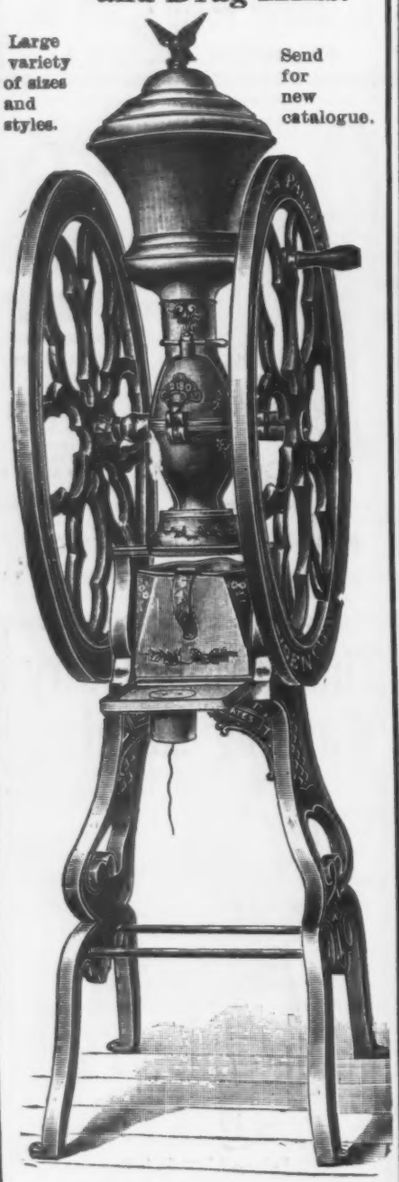


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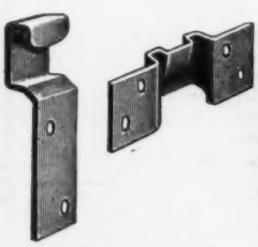
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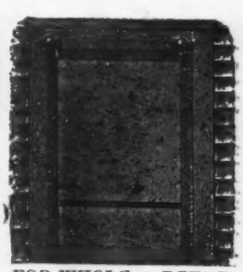


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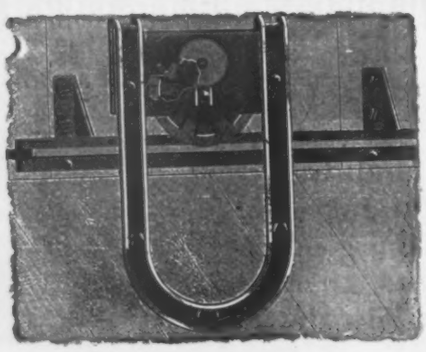
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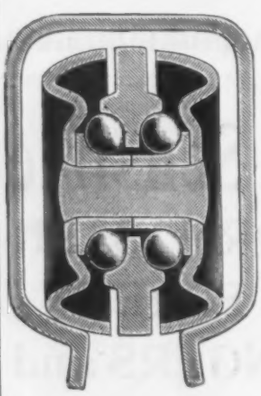
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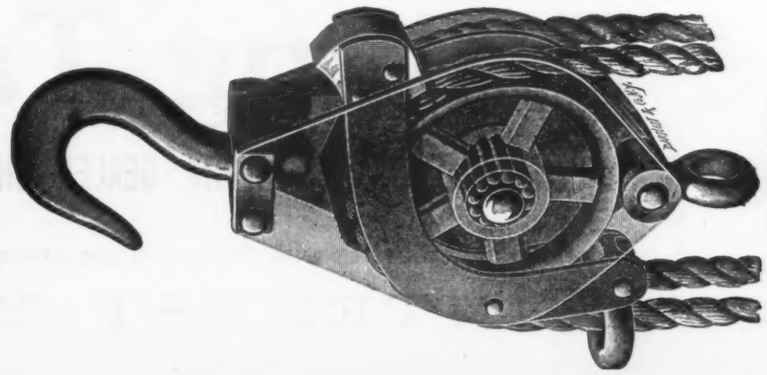
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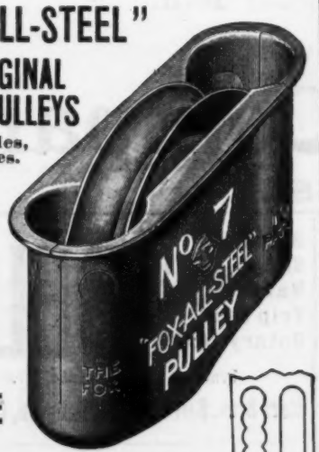


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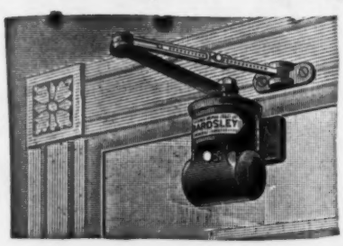
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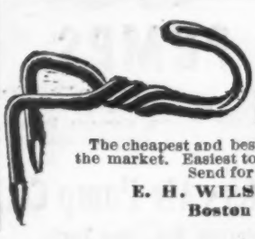


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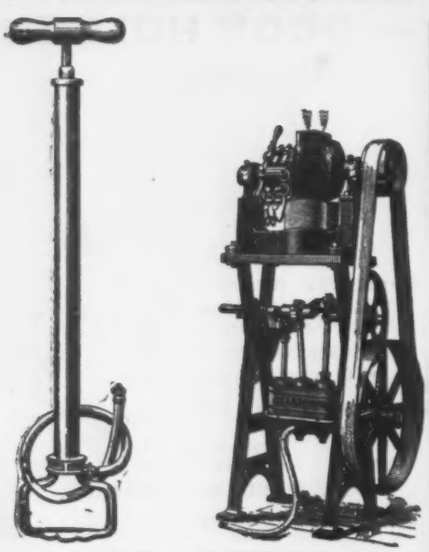
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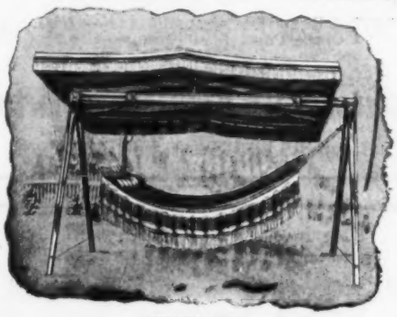
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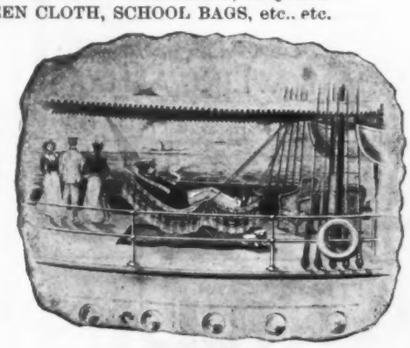
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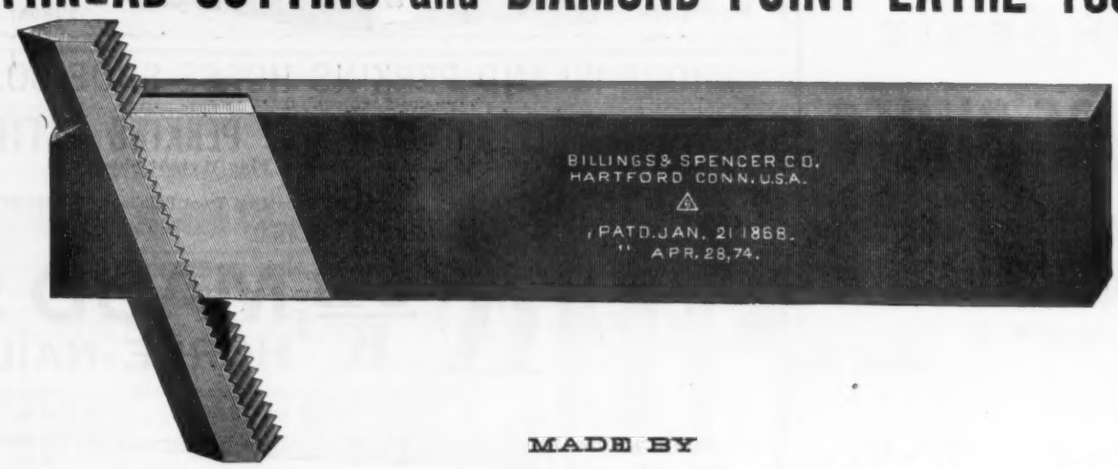
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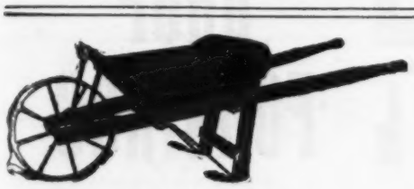
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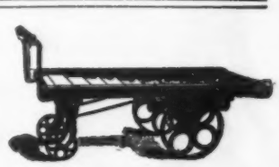


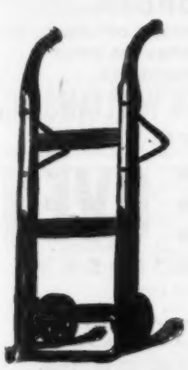
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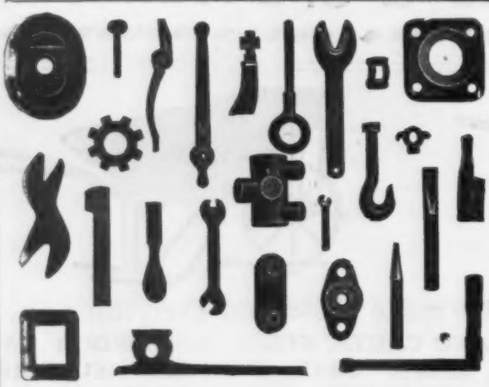


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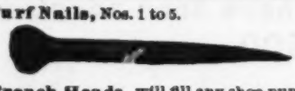
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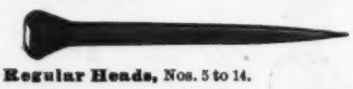
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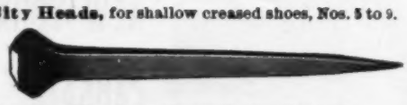
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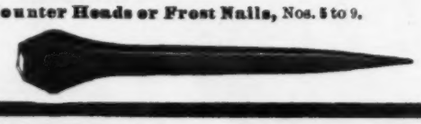
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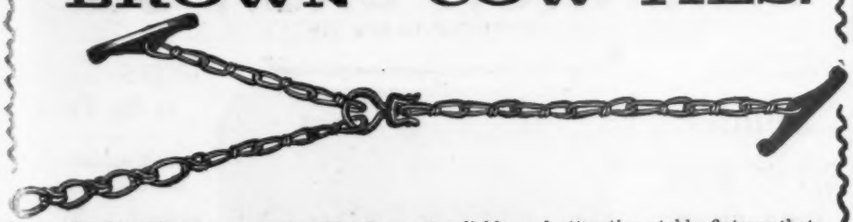
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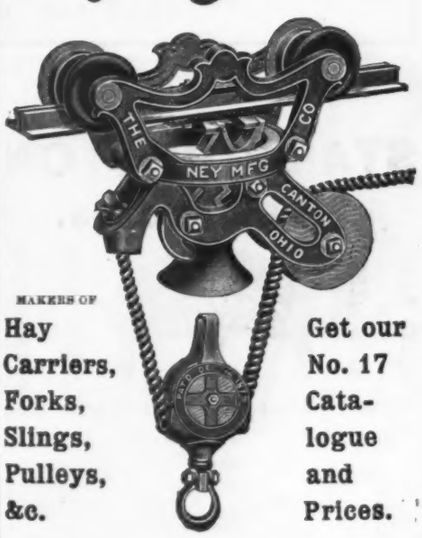
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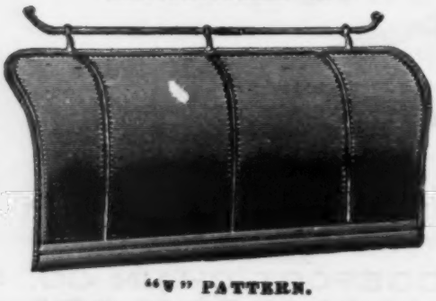
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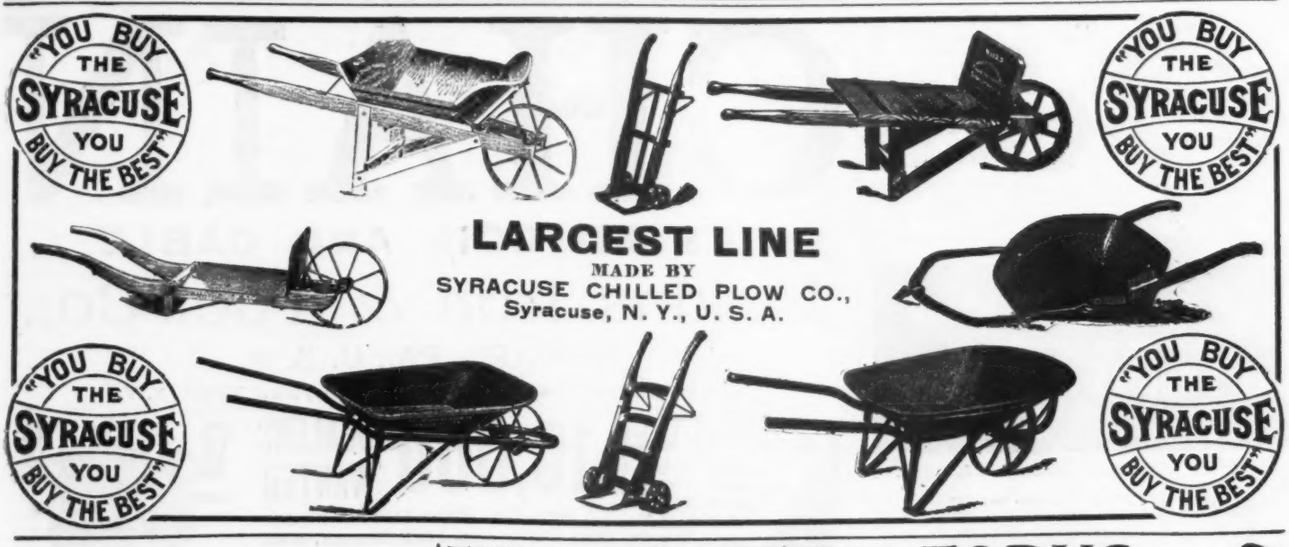


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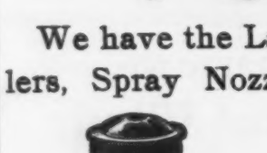
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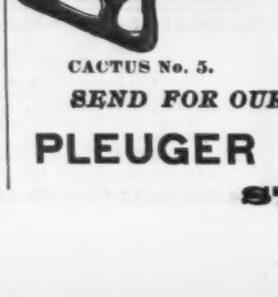
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Acme Shear Co.....101
Acme Steel & Malleable Iron Works..... 33
Adam, W. J..... 9
Adams Co..... 65
Adriance Machine Works..... 72
Affleck, Geo. E 83
Aiken, Henry..... 40
Ajax Mfg. Co..... 58
Alabama Consolidated Coal & Iron Co..... 25
Albany Foundry Co..... 37
Alexander Bros..... 49
Aliquippa Steel Co..... 27
Allentown Rolling Mills..... 35
Allis, E. P. Co..... 45
American Appraisal Co..... 91
American Bicycle Co..... 15
American Bicycle Co..... 92
American Blower Co..... 67
American Bridge Co..... 15
American Carburizing Co..... 34
American Gas Furnace Co... 68
American Emery Wheel Wks. 57
American Hardware Mfg. Co.. 93
American Iron & Steel Mfg. Co..... 25
American Mfg. Co.....6&94
American Metal Co..... 3
American Nickeloid Co..... 4
American Pig Iron Storage Warrant Co..... 32
American Pulley Co..... 50
American Railway Supply Co. 92
American Screw Co.....110
American Shearer Mfg. Co.... 95
American Sheet Steel Co....1&22
American Steel Hoop Co..... 21
American Steel Scraper Co... 95&134
American Steel & Wire Co.... 10
American Tin Plate Co..... 22
American Tool Chest Co.....101
American Tool Works Co..... 73
Ames Sword Co..... 49
Ansonia Brass & Copper Co... 2
Arcade File Works.....116
Arcade Malleable Iron Co..... 34
Arcade Mfg. Co.....122
Armstrong Bros. Tool Co..... 63
Armstrong Mfg. Co..... 62
Armstrong, R. S. & Bro..... 89
Asher, A..... 87
Ashland Steel Co..... 24
Ashton Valve Co..... 42
Asphalt Ready Rfg. Co..... 8
Athol Machine Co.....115
Athol Pump Co.....109
Atkins, E. C. & Co..... 98
Atlas Bolt & Screw Co..... 44
Atlas Mfg. Co.....105&143
Aultman Co..... 49
Automatic Machine Co..... 71
Avery Stamping Co .....93&103

B

Babcock & Wilcox Co..... 46
Baeder, Adamson & Co..... 96
Baird, C. K. & Co..... 25
Baird, U. Machinery Co..... 86
Baker, Jas. H. Mfg. Co..... 36
Ball Bearing Co..... 54
Bardsley, Jos.....125
Barker & Chard Mch. Tool Co. 77
Barnes, Wallace Co..... 5
Barnes, B. F. Co..... 78
Barnes, W. F. & John Co..... 65
Barnes Mfg. Co.....109
Barnett, G. & H. Co.....117
Barney & Reed Mfg. Co.....124
Barnum, E. T..... 6
Barrett, W. L.....105
Baush Mch. Tool Co..... 79
Bayley, Wm. & Sons Co..... 72
Beaudry & Co..... 66
Becker & Brainard Milling Mch. Co..... 71
Belden Machine Co..... 37
Bell, Edwin & Sons Co.....128
Bement, Miles & Co..... 76
Bemis & Call Hardware & Tool Co.....114
Berger Bros. Co..... 97
Besly, C. H. & Co.....144
Best, L..... 56
Bessemer Coke Co..... 38
Bethlehem Fdry. & Mch. Co.. 68
Bethlehem Steel Co..... 32
Bevin Bros. Mfg. Co.....126
Bickford Drill & Tool Co..... 66
Bicknell Hardware Co..... 66
Bicycle Step Ladder Co.....106
Bigelow, J. F..... 98
Bignall & Keeler Mfg. Co..... 62
Billings & Spencer Co.....129
Bishop, Geo. H. & Co.....108
Bissell, E. & Co..... 90
Blackman & King..... 4
Blackwell, G. G. Sons & Co... 28
Blair, Reed F. & Co..... 29
Blake, M. J. & M..... 89
Blake & Johnson..... 16
Bliss Co., E. W..... 77
Bliss, R. Mfg. Co 102
Bolker, Hermann & Co..... 28
Bole, Keas & Co..... 32
Bommer Bros.....144
Booth, The Lloyd Co..... 32
Borgner, Cyrus..... 35
Boston Belting Co..... 50
Boston Blower Co..... 67
Boston Bridge Works..... 19
Boston Gear Works..... 58
Boston & Lockport Block Co. 8
Botjer, C..... 89
Bowler, Geo. H..... 86
Box, Alfred & Co..... 54
Braddock Mach. & Mfg. Co... 14
Bradlee & Co..... 25
Bradley Co..... 71
Braeburn Steel Co..... 31
Brammer, H. F. Mfg. Co.....121
Braunsdorf-Mueller Co..... 98
Bridgeport Brass Co..... 2
Bridgeport Chain Co.....131
Bridgeport Deoxidized Bronze & Metal Co..... 2
Bridgeport Gun Implement Co.....128
Bridgeport Mfg. Co.....101
Bridgeport Safety Emery Wheel Co..... 56
Briggs, Marvin..... 82
Bristol Co..... 1
Broderick & Bascom Rope Co. 7
Brolmard Co.....125
Brooks, M. S. & Sons..... 5
Brown & Co., Inc..... 95
Brown, E. E. & Co.....124
Brown Hoisting & Conveying Mch. Co..... 52
Brown, R. H. & Co..... 96
Brown & Sharpe Mfg. Co..... 81
Buck Bros.....101
Buck, Chas.....101
Buffalo Emery Wheel Co.....111
Buffalo Forge Co.....93&144
Buhl Malleable Co..... 51
Bullard Mch. Tool Co..... 70
Burden Iron Co.....130
Burditt & Williams.....133
Burke, P. F.....130
Burnham, Geo. Co..... 67
Butterfield & Co..... 58
Byram & Co..... 89

C

Cabeen & Co..... 81
Cahall Sales Dept.....1&94
Caldwell Mfg. Co..... 96
California Wire Works..... 52
Canfield, H. O.....134
Capewell Horse Nail Co..... 1
Carborundum Co..... 57
Card, S. W. Mfg. Co..... 61
Carlin's Sons, Thomas Co..63&85
Carter & Hakes Machine Co. 64
Cary Mfg. Co..... 95
Cary Spring Works..... 5
Cattaraugus Cutlery Co.....101
Central Hardware Co.....105
Chambers Bros. Co.....117
Champion Blower & Forge Co 65
Champion Iron & Steel Co.... 26
Chandler & Farquhar.....111
Chapman, J. B. & Co..... 54
Chapman Valve Mfg. Co..... 45
Charter Gas Engine Co..... 44
Chatillon, John & Sons..... 4
Cheney, S. & Son..... 35
Cherry Valley Iron Co..... 25
Chesley Machinery Co..... 85
Chester Steel Casting Co..... 31
Chicago Drop Forge & Fdy. Co..... 36
Chicago Flexible Shaft Co.... 68
Chicago House Wrecking Co.. 86
Chicago, Milwaukee & St. Paul Ry..... 92
Chicago Pneumatic Tool Co... 78
Chicago Scale Co.....134
Chicago Screw Co..... 18
Chicago Spring Butt Co.....122
Chicago Time Register Co.... 108
Chilicott-Evans Chain Co 92
Chisholm & Moore Mfg. Co.144
Chrome Steel Works..... 31
Church, Isaac..... 18
Church, S. R..... 25
Cincinnati Mach. Tool Co..... 69
Cincinnati Milling Mch. Co... 79
Cincinnati Planer Co..... 71
Clapp, E. D. Mfg. Co 128
Clark, John W..... 3
Clark & Cowles..... 5
Clark & Parsons Co.....143
Clark, Quien & Morse..... .118
Clark, W. J. Co..... 49
Clay Stamping Co..... 47
Clayton Air Compressor Wks. 47
Cleveland Bolt & Screw Co.... 67
Cleveland City Forge & Iron Co..... 1
Cleveland Crane & Car Co.... 53
Cleveland Elevator Bucket Co 49
Cleveland Stamping & Tool Co. 94
Cleveland Stone Co.....125
Cleveland Twist Drill Co.... 58
Clinton Wire Cloth Co..... 12
Cobb & Drew..... 16
Coburn Trolley Track Mfg. Co.....110
Codling Mfg. Co..... 84
Coes Wrench Co.....113
Coldwell Lawn Mower Co....132
Coleman Hardware Co.....123
Conn. Valley Mfg. Co..... 97
Consolidated Iron & Steel Co. 23
Consolidated Rail'y Electric Lighting & Equipment Co. 37
Continental Tool Co.....132
Cook, A. D..... 47
Cook, Asa S. & Co..... 68
Cook, H. C. & Co.....121
Cornell, J. B. & J. M.....77&87
Cotton, Barclay W. & Co..... 82
Covert Mfg. Co.....133
Covert's Saddlery Works..... 95
Cox, Justice, Jr. & Co., Ltd... 80
Cramp, Wm. & Sons S. & E. B. Co..... 3
Crane, W. M. Co..... 33
Crescent Brass & Iron Co..... 97
Crescent Phosphorized Metal Co..... 8
Crescent Mfg. Co..... 18
Crescent Steel Co..... 29
Cresson, Geo. V. Co..... 43
Cronk Hanger Co.....114
Crosby Steam Gage & Valve Co..... 46
Cross & Speirs Machine Co... 64
Cunliffe, R. M..... 89
Curtis & Curtis..... 61
Cushman Chuck Co..... 60

D

Dallett, Thos. H. & Co..... 74
Dame, Stoddard & Co.....126
Danielson Mch. & Tool Co..... 84
D'Amour & Littledale Mch. Co 66
Darby, Edw. & Sons..... 12
Dart, E. M. Mfg. Co..... 39
Davis, W. P. Machine Co...68&84
Davis & Buxton Stamping Co.126
Davol, John & Sons..... 2
Dawson, A. L. & Co..... 85
Defiance Mch. Wks..... 66
DeKalb Fence Co..... 11
Deming Co.....109
Denman & Davis..... 28
Detrick & Harvey Machine Co 66
Diamond Drill & Mch. Co..... 33
Diamond Machine Co..... 57
Diamond Tack & Nail Wks... 19
Dickinson, T. L..... 55
Dienelt & Eisenhardt..... 64
Dillon-Griswold Wire Co..... 11
Dimmick, J. K. & Co..... 82
Disston, Henry & Son..... 99
Divine Bros. Co..... 56
Dixon, Jos. Crucible Co..... 49
Doan, J. B. & Co..... 84
Dodge Machine Screw Co.....100
Dodge Mfg. Co..... 51
Doebler Mfg. Co..... 62
Donaldson & Newton..... 89
Draper Machine Tool Co..... 78
Drouve, G. Co.....126
Dudgeon, Richard..... 64
Duff Patents Co..... 40
Dunbar Bros..... 6
Dunham Nut Co..... 17
Dupont Mfg. Co..... 70
Durant, W. N..... 58
Dwiggins Wire Fence Co..... 9

E

Eagle Anvil Works.....112
Eastern Bridge & Structural Co..... 19
Eastern Forge Co..... 84
Eastern Machinery Co..... 50
Eccles, Richard.....131
Eclipse Bicycle Co.....128
Eckstein, C. G..... 54
Eddy Electric Mfg. Co..... 43
Edson Mfg. Co.....109
Eimer & Amend..... 38
Electric Controller & Supply Co..... 47
Ellis & Halfenbarger..... 11
Empire Pipe Bending & Supply Co..... 4
Energy Mfg. Co.....117
Ensign, Bickford & Co.....106
Enterprise Mfg. Co.....119
Erie Specialty Co.....108
Erikson, Edw. E..... 40
Estey Wire Works Co..... 7
Etting, Edw. J..... 32
Eucker, L. A. Stamp Wks.....117
Evans, S. F..... 43
Everson, B. M..... 87
Excelsior Needle Co.....144
Exeter Machine Works..... 67

F

Fairbanks Co .....75&86
Fairmount Machine Co..... 48
Farrel Foundry & Mch. Co. 81&41
Fay, J. A. & Egan Co..... 57
Ferracute Mach. Co..... 71
Ferro Carbon Casting Co..... 35
Field, C. H..... 63
Filer & Stowell Co..... 45
Finished Steel Co..... 23
Fish, H. C. Machine Works.... 77
Fitch, W. & E. T. Co. The.....143
Flagg, Stanley G. & Co.....144
Flint & Walling Mfg. Co.....109
Folding Paper Box Co.....113
Ford Bit Co.....101
Forest City Foundry & Mfg. Co.....115
Forest City Steel & Iron Co.. 89
Forster Pulley Works 48
Fox Machine Co.....125
Frankford Steel Co..... 36
Frank-Kneeland Mach. Co.... 33
Franklin, H. H. Mfg. Co..... 92
Frick, H. C. Coke Co..... 94
Frost Wire Fence Co..... 9
Fulton Iron & Engine Works. 51

G

Gardner Bros..... 35
Garland Chain Co.....102
Garrison, A., Foundry Co..... 33
Garry Iron & Steel Roofing Co 9
Garvin Machine Co..... 75
Gem Mfg. Co..... 95
General Electric Co..... 43
General Supply Co..... 59
Geometric Drill Co..... 60
Gerlach, Peter & Co..... 54
Gilbert & Bennett Mfg. Co.... 12
Gilmour, J..... 53
Gleason-Peters Air Pump Co.126
Gleason Tool Co.....144
Goepel & Raegener..... 7
Goodell Co.....102
Goodell-Pratt Co.....107
Goodwin & Kintz Co..... 93
Gould & Eberhardt..... 66
Graham, John H. & Co.....111
Grand Crossing Tack Co..... 16
Grand Rapids Hardware Co ..125
Gray, Robt. J..... 87
Green, A. H.....106
Greiner, F..... 89
Griffin Mfg. Co.....101
Griswold Wire Co..... 5
Gunn & Hannah..... 97

H

Hagen & Reid.....100
Haines Gauge Co..... 39
Hale Bros.....100
Halk & Naumann..... 3
Hall, Thomas.....111
Hall's, Samuel, Sons..... 14
Hamlin, Geo. R..... 7
Hammer & Co.....113
Hannan & Finton..... 86
Harrington, E. Son & Co...52&79
Harrington & King Perforating Co..... 5
Harrington & Richardson Arms Co.....128
Harris, Samuel & Co..... 47
Harrison Safety Boiler Wks.. 46
Hartford Steam Boiler Insp. and Ins. Co..... 42
Hartigan, W. R.....121
Hartman Mfg. Co..... 9
Harvey, Arthur C. Co..... 27
Haskell, Wm. H. Mfg. Co..... 18
Haws, W. H. Fire Brick Co... 85
Hay, Budden Mfg. Co.....115
Hazard Mfg. Co..... 7
Heald, L. S. & Son..... 58
Heat Transmission Co..... 42
Heckert-Baltzley Billet Co... 26
Heinisch's, R. Sons.....101
Heller Bros. Co.....115
Heller Box Co 106
Henderer's, A. L. Sons..... 64
Henderson Bros..... 39
Hendey Machine Co..... 94
Hendricks Bros..... 2
Hendryx, A. B. Co..... 8
Hess, Snyder & Co 41
Heyl & Patterson..... 86
Hibbard, W. H..... 70
Hickman, Williams & Co..... 29
Hiertz, T. & Son 8
Hiles, C. A. & Co.....104
Hill, Henry F..... 82
Hill, N. N. Brass Co.....126
Hill, Clarke & Co.....69&82
Hill Dryer Co.....143
Hilles & Jones Co.....68&86
Hillman, J. H. & Son..... 85
Hitner, H. A. Sons..... 87
Hobson, Houghton & Co..... 28
Hoefer Mfg. Co..... 65
Hofeller, Theo. & Co..... 95
Hoffman, Geo. W.....106
Hoggson & Pettis Mfg. Co..... 60
Hollands Mfg. Co.....117
Hollinger Fence Co. 5
Hoover & Gamble Co 67
Horsburgh & Scott..... 59
Horton, E. & Son Co..... 60
Hough Cash Recorder Co.....108
Houghton & Buxton Mfg. Co. 98
Houston, C. B. & Co..... 30
Howard Iron Works.....116
Howard & Morse..... 7
Howson & Howson..... 7
Hubbell, Harvey..... 14
Huber, S. V. & Co..... 40
Hudson Parer Co.....118
Humphryes Mfg. Co.....109
Hungerford, U. T. Brass & Copper Co..... 3
Hunt, C. W. Co..... 43
Huribut Rogers Mach. Co..... 64

I

Ideal Machine Works..... 59
Ideal Mfg. Co.....128
Illinois Malleable Iron Co 87
Illinois Screw Co.....134
Illinois Steel Co..... 89
Illinois Zinc Co..... 3
Imperial Bit & Snap Co.....133
Indianapolis Drop Forging Co..... 37
Ingersoll-Sergeant Drill Co... 47
International Silver Co.....103
Iowa Farming Tool Co.....133
Ironsides Co. 4
Isaac Joseph Iron Co..... 89
Ives, H. B. & Co..... 95
Ivins, Ellwood..... 25

J

Jackson Flue Scraper Co..... 46
Janney, Steinmetz & Co..... 7
Jarecki Mfg. Co..... 63
Jefferson Iron Co..... 88
Jeffrey Mfg. Co..... 48
Jenckes, E. Mfg. Co..... 5
Jenkins Bros..... 1
Jenkins Iron & Tool Co.....134
Jenkinson, R. C. & Co..... 6
Jennings, C. E. & Co.....100
Jennings, Russell Mfg. Co....101
Jessop, Wm. & Sons..... 28
Johnson, I. H., Jr., & Co..... 66
Johnson, Iver, Arms & Cycle Works.....143
Johnson, Wm. C. & Sons Mch. Co 86
Jones, B. M. & Co..... 30
Jones, Jesse Paper Box Co....106
Jones & Lamson Machine Co. 94
Jones & Laughlins, Ltd..... 88

K

Keagy & Lear Machine Co... 63
Keeley, Jerome & Co..... 30
Keen & Hagerty Mfg. Co.....119
Kelley, B. F. & Son..... 85
Kennedy, Julian..... 38
Kennedy, Walter..... 40
Kennedy Valve Mfg. Co.....144
Kerrick, J. H..... 83
Keystone Drop Forge Works. 54
Keystone Mfg. Co..... 111
Kidd Bros. & Burgher Steel Wire Co..... 6
Kidder, R. E..... 65
Kilborn & Bishop Co 36
Kilbourne & Jacobs Mfg. Co..132
Kilmer Wire Mfg. Co..... 11
Kimball, C. J. Co.....104
Kimball Bros. & Sprague..... 19
King, J. M. & Co.....117
Kokomo Fence Mach. Co..... 9
Konigslow, E. & Bro..... 93
Kupferle, Jno. C..... 93

L

La Belle Steel Co..... 29
Ladd, W. C.....100
Lake City Engineering Co.... 44
Lamond, David..... 40
Landis Tool Co..... 56
Lane Brothers Co.. 125
Lang Cutlery Works.....100
Lansing Wheelbarrow Co.....129

Laughlin, Alex & Co. 40
Law, Ernest & Co. 30
Lawrence Bros. 124
Lea, J. Tatnall & Co. 30
LeCount, Wm. G. 116
Leffer, Chas. & Co. 75
Leng's, Jno. S., Son & Co. 144
Leonard, John & Co. 89
Leonhardt & Co. 130
Leschen, A. & Sons Rope Co. 7
Levis, Henry & Co. 32
Lewis Tool Co. 117
Lidgerwood Mfg. Co. 144
Lilienberg, N. 29
Lima Steel Castings Co. 31
Lindsay, W. W. & Co. 24
Link-Belt Engineering Co. 52
Livermore, Homer F. 34&36
Lockhart Iron & Steel Co. 28
Lodge & Shipley Mch. Tool Co. 82
Logan Iron & Steel Co. 89
Logan & Strobridge Iron Co. 100
Lombart Iron Works & Supply Co. 36
Lorain Foundry Co. 82
Lorain Steel Co. 29
Louden Mchy. Co. 134
Loyd, John 98
Ludlow-Saylor Wire Co. 8
Lufkin Rule Co. 107
Lukens Iron & Steel Co. 27
Lund, S. T. 84
Lyon, N. 106

M

McCabe, J. J. 75&82
McCabe Hanger Mfg. Co. 19&124
McCaffrey File Co. 116
McClure, G. W., Son & Co. 40
McCoy, Jos. F. Co 53
McCullough Iron Co. 28
McDowell, Stocker & Co. 83
McFarland, Wm. 6
McGowan, J. H. & Co. 47
McInnes, C. E. 27
McKay, Jas. & Co. 30
McKinney Mfg. Co. 122
McKinnon Dash Co. 133
McNab & Harlin Mfg. Co. 44
Magnolia Metal Co. 1
Main Belting Co. 49
Maine Mfg. Co. 123
Manning, Maxwell & Moore. 84
Manogue-Pidgeon Iron Co. 36
Manville Machine Co., E. J. 81
Markham Air Rifle Co. 128
Markle Lead Works. 93
Marlin Fire Arms Co. 128
Marshall & Huschart Machy. Co. 85
Mason & Parker 101
Mason Regulator Co. 45
Matthiessen & Hegeler Zinc Co. 2
Maurer, H. & Son. 35
May & Spalding. 89
Mayhew, H. H. Co. 113
Maywood F'dry & Mch. Co. 39
Merchant & Co. 3
Merrell Mfg. Co. 64
Merrill Bros. 1
Mersick C. S. & Co. 54
Mesta Machine Co. 32
Mianus Electric Co. 134
Michigan College of Mines. 92
Michigan Wire Cloth Co. 15
Mietz, Aug. 44
Milbradt, G. A. & Co. 106
Miles, F. S. 17
Miles, E. O. & Co. 89
Millar, C. & Son Co. 144
Miller, Edward & Co. 129
Miller, H. J. 16
Miller & Van Winkle. 144
Miller Engineering Co. 40
Millers Falls Co. 36&144
Millett Core Oven Co. 130
Milne, A. & Co. 30
Milton Mfg. Co. 17
Milwaukee Tack Co. 16
Miner & Peck Mfg. Co. 66
Mitchell, W. B. 106
Mohr, J. J. 30
Monce, S. G. 102
Montgomery, R. R. & Co. 118
Mooney, W. M. & Co. 130
Moore, C. P. 106
Moore, Franklin Co. 16
Morgan Construction Co. 11
Morgan Spring Co. 5
Morley Bros. 106
Morris, F. Hollingsworth. 86
Morrison, Robert 44
Morse Twist Drill & Mch. Co. 59
Morse, Williams & Co. 54
Morton, Thos. 121
Morton Mfg. Co. 67
Moseley Iron Bridge & Root Co. 19
Mossberg, Frank Co 93
Mossberg & Granville Manufacturing Co. 79
Mugford, A. 97
Murdock Parlor Grate Co. 59
Myers, F. E. & Bro. 109

N

Nanz, C. & Co. 4
Narragansett Mch. Co. 128
Nash, Geo. & Co 30
National Abrasive Mfg Co. 57
National Cutlery Co. 100
National Elastic Nut Co. 14
National Horse Nail Co. 130
National Machinery Co. 60
National Pancoast Ventilator Co. 97
National Pipe Bending Co. 41
National Saw Co. 98
National Sewing Machine Co. 120
National Specialty Mfg. Co. 122
National Steel Co. 27
National Tube Co. 20
National Wire Corp. 18
Naugatuck Mfg. Co. 45
Nazel & Bassett 68
Ness, Geo. M., Jr. 117
New Albany Mfg. Co 36
New Brunswick Fdry Co. 36
New Century Mfg. Co. 97
New Doty Mfg. Co. 72
New England Steel Casting Co. 31
New England Structural Co. 19
New Freedom Wire Cloth Co. 13
Newhall, Henry B. 19
New Haven Mfg. Co. 71
New Haven Wire Mfg. Co. 5
N. J. Iron & Metal Co. 89
N. J. Wire Cloth Co. 12
Newkirk, J. B. & Co. 30
Newport News Shipbuilding & Dry Dock Co 45
New Process Twist Drill Co. 59
N. Y. Air Compressor Co. 47
N. Y. Blower Co. 67
N. Y. Machinery Depot. 82
N. Y. Stamping Co. 105
Ney Mfg. Co. 131
Niagara Machine & Tool Works 69
Niagara Screw Co. 14
Nicholson, W. H. & Co. 92
Nicholson File Co. 115
Nicol & Co. 100
Nicoll, B. & Co. 88
Niles Tool Works Co. 76&83
Nilson, A. H. Mch. Co. 74
North American Metalline Co 8
North Brot. Mfg. Co. 96
Northampton Emery Wheel Co. 55
Northern Engineering Works 53
Norton Emery Wheel Co. 55
Norton Mfg. Co 105
Norwalk Iron Works Co. 47
Norwalk Pattern & Mfg. Co. 92
Nut & Washer Mfg. Co. 14
Nuttall, R. D. Co. 73

O

Obermayer, S. Co. 33
Oefinger, J. L. 125
Ogden & Wallace 39
Oneida Community 102
Ormsby, E. A. 8
Ornamental Iron & Wire Co. 8
Osborn Mfg. Co. 103
Ossawan Mills Co. 143
Ostrander Fire Brick Co. 85
Ostrander, W. R. & Co. 106
Otis Steel Co. 31

P

Palmer, I. E. 127
Palmer Hardware Mfg. Co. 125
Paradox Machinery Co. 84
Pardee, C. Works. 25
Parker, Chas. Co. 122
Passaic Rolling Mill Co. 27
Patch, F. R. Mfg. Co. 66
Patterson, F. L. 83
Pawling & Harnischfeger 53
Paxson, J. W. Co. 42
Peck, Stow & Wilcox Co. 118
Pedrick & Ayer Co. 42
Peerless Rubber Mfg. Co. 50
Pelouze Scale & Mfg. Co. 134
Pennsylvania Engineering Wks. 33
Pennsylvania Machinery Co. 33
Pennsylvania Smelting Co. 25
Perkins, B. F. & Son. 67
Perkins, Henry 18
Perkins Machine Co. 77
Perry, Wm. H. Co. 89
Peters Cartridge Co. 127
Phenix Tube Co. 36
Phila. Machine Screw Works. 18
Phila. Machine Tool Co. 67
Phila. Pneumatic Tool Co. 71
Phila. Roll & Machine Co. 33
Phillips' F. R. & Sons Co. 34&39
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Pullman Sash Balance Co. 125
Putnam Nail Co. 131

Q

Quint, A. D. 69

R

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Rudolphi & Krummel 70
Rutter, A. T. 2
Ryan, J. J. & Co. 2

S

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St. Louis Shovel Co. 133
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Schwerdtle & Siebert. 117
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T

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U

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V

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Vulcanus Forging Co. 39

W

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Wurster, F. W. & Co. 144
Wyman & Gordon. 103

Y

York, S. M. Co. 82
York Mfg. Co. 34
Young, W. C. Mfg. Co. 66
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Z

Zacharias & Co. 123

Published by DAVID WILLIAMS Co., 232-238 William St., New York. Printed by THE WILLIAMS PRINTING Co., General Book, Commercial and Newspaper Printers and Binders, 232-238 William St., New York.

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Scranton Forging Co., Scranton, Pa.

Carriage and Wagon Springs
Rowland, Wm. & Harvey, Phila., Pa.

Cars,
Atlas Bolt & Screw Co., Cleveland, O.
Sheffield Car Co., Three Rivers, Mich.

Cartridges
Hungerford, U. T., Brass & Copper Co. 121 Worth St., N. Y.
Peters Cartridge Co., Cincinnati, O.

Carving Tools
Buck, Chas., Millbury, Mass.

Case Hardening Material
American Carburizing Co., Jersey City, N. J.

Cash Recorders
Hough Cash Recorder Co., Indian Orchard, Mass.
Whiting Mfg. Co., Northboro, Mass.

Castings, Atlas Metal
Ferro-Carbon Castings Co., Phila., Pa.

Castings, Brass, Bronze and Copper
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.
Chapman, J. B. & Co., Springfield, Mass.
Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.
Ryan, J. J. & Co., Chicago, Ill.
West Side Foundry Co., Troy, N. Y.

Castings, Finished
Franklin, H. H. Mfg. Co., Syracuse, N. Y.

Castings, Iron
Albany Foundry Co., Albany, N. Y.
Barney & Reed Mfg. Co., Boston, Mass.
Baush Mch. Tool Co., Springfield, Mass.
Booth, The Lloyd Co., Youngstown, O.
Bayley, Wm. & Sons Co., Milwaukee,
Cheney, S. & Son, Manlius, N. Y.
Chisholm & Moore Mfg. Co., Cleveland.
Clark, John W., Albany, N. Y.
Codling Mfg Co. Bristol, Conn.
Coleman Hardware Co., Chicago, Ill.
Crane, Wm. M. Co., 1131 Broadway, N.Y.
Diamond Drill & Mch. Co., Birdsboro Pa.
Farrel F'dry & Mch. Co., Ansonia, Ct.
Forest City Foundry & Mfg. Co., Cleveland, Ohio.
Livermore, H. F., Boston, Mass.
Lombard Iron Works & Supply Co., Augusta, Ga.
Lorain Foundry Co., Lorain, Ohio.
New Albany Mfg. Co., New Albany, Ind
New Brunswick Fdy. Co., New Brunswick, N. J.
Norwalk Pattern & Mfg. Co., So. Norwalk, Conn.
Phila. Roll & Mch. Co., Philadelphia, Pa.
Ramapo Car Wheel Co., Ramapo, N. Y.
Randolph Iron Co., Brooklyn, N. Y.
Sessions Foundry Co., Bristol Conn.
Smith & Caffrey, Syracuse, N. Y.
Spencer's I. S. Sons, Guilford, Conn.
Standard Fdy. & Mfg. Co., Cleveland, O.
U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.
West Side Foundry Co., Troy, N. Y.
Wetherill, Robert & Co., Chester, Pa.
Wheeling Mold & Fdry. Co., Wheeling, W. Va
Youngstown Fdry. & Mch. Co., Youngstown, O.

Castings, Malleable
Acme Steel and Mall. Iron Works, Buffalo, N. Y.
Arcade Mall. Iron Co., Worcester, Mass.
Hammer & Co., Branford, Conn.
Illinois Mall. Iron Co., Chicago, Ill.
Jarecki Mfg. Co., Erie, Pa.
York Mfg. Co., York, Pa.

Castings, Steel
Arcade Malleable Iron Co., Worcester, Mass.
Bethlehem Steel Co., So. Bethlehem, Pa
Chester Steel Casting Co., Phila. Pa.
Chrome Steel Works, Brooklyn, N. Y.
Flagg, Stanley G. & Co., Phila., Pa.
Lima Steel Castings Co., Lima, O.
Livermore, Homer F., Boston, Mass.

SEE ALPHABETICAL INDEX, PAGES 135–136.

Morris, P. Hollingsworth, Phila., Pa.
New England Steel Castings Co., Philadelphia, Pa.
Otis Steel Co., Ltd., Cleveland, Ohio
Union Steel Casting Co. ,Pittsburgh,Pa.

Catalogue Files
Folding Paper Box Co. So. Bend., Ind.

Ceilings, Metal
Youngstown Iron & Steel Roofing Co., Youngstown, O.

Cements, Iron
Smooth On Mfg. Co., Jersey City N. J.

Chain
Bradlee & Co., Philadelphia.
Bridgeport Chain Co., Bridgeport, Ct.
Chilicott-Evans Chain Co., Allegheny, Pa.
Garland Chain Co., Rankin, Pa.
Hale Bros., Worcester, Mass.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Jenkins Iron & Tool Co., Howard, Pa.
Link-Belt Engineering Co., Phila., Pa.
McKay Jas. & Co., Pittsburgh, Pa.
Oneida Community, Ltd., Niagara Falls
Standard Chain Co., Pittsburgh, Pa.

Chain Plants
Turner, Vaughn & Taylor Co., Cuyahoga Falls O.

Chemicals
Eimer & Amend, New York.

Cherry Stoners.
Enterprise Mfg. Co., Philadelphia Pa.
Goodell Co., Antrim, N. H.

Chisels
Buck Bros., Millbury, Mass.
Buck, Chas. ,Millbury, Mass.
Jennings, C. E. Co., 101 Reade St., N. Y.
White, L. & I. J. Co., Buffalo, N. Y.

Christmas Tree Holders
North Bros. Mfg. Co., Philadelphia, Pa.

Chucks
Cushman Chuck Co., Hartford, Conn.
Doebler Mfg. Co., Middletown, Conn.
Goodell Pratt Co., Greenfield, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn
Holland Mfg. Co., Erie, Pa
Horton, E. & Son Co., Windsor Locks, Ct.
Ideal Machine Works, Hartford, Conn.
Pratt Chuck Co., Frankfort, N. Y.
Skinner Chuck Co., New Britain, Conn.
Standard Tool Co., Cleveland, O.
Union Mfg. Co., 108 Chambers, N. Y.
Whiton, D. E. Mach. Co., New London,

Cider Mills
Whitehurst, R. W. & Co., Norfolk, Va.

Circular Sawing Machines
Kidder, E. E., Worcester, Mass.

Clamps
Besley, C. H. & Co., Chicago, Ill.
Hall, Thos., Brooklyn, N. Y.
Hammer & Co., Branford, Conn

Clipping Machines
Amer. Shearer Mfg. Co., Nashua, N. H.
Chicago Flexible Shaft Co., Chicago, Ill.
McCoy, Jos. F., Co., 26 Warren St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St. N. Y.

Clothes Dryers
Hill Dryer Co., Worcester, Mass.

Clothes Line Hook
Wilson, E. H. & Co., Allston, Mass.

Clothes Pins
U. S. Clothes Pin Co., Montpelier, Vt.

Coal
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.

Coal Cars
Lansing Wheelbarrow Co., Lansing, Mich.

Coal Picks
Jenkins Iron & Tool Co., Howard, Pa.

Coal Shutes
Lansing Wheelbarrow Co., Lansing, Mich.

Coasters
Eclipse Bicycle Co., Elmira, N. Y.

Coffee and Spice Mills
Arcade Mfg. Co., Freeport, Ill.
Parker, Chas. Co., Meriden, Conn.

Coke
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Bessemer Coke Co., Pittsburgh, Pa.
Cherry Valley Iron Co., Pittsburgh, Pa.
Dimmick, J. K. & Co., Phila., Pa.
Frick, H. C. Coke Co., Pittsburgh, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Sloss Sheffield Steel & Iron Co., Birmingham, Ala.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Virginia Iron, Coal & Coke Co., Bristol, Va.—Tenn,
Washington Coal & Coke Co., Dawson, Pa.
Wister, Francis, Philadelphia, Pa.

Colleges
Michigan College of Mines, Houghton, Mich.

Compressed Air Machinery
Phila. Pneumatic Tool Co., Phila Pa.

Conductor Pipe
Berger Bros. Co., Philadelphia, Pa.

Conveying Machinery
Aultman Co., Canton, Ohio.
Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
California Wire Works, San Francisco,
Hunt, C. W. Co., W. New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Cooking Utensils
Cleveland Stamping & Tool Co., Cleveland, O.

Copper
Hendricks Bros., 49 Cliff, N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
United Metals Selling Co., 11 Broadway, N. Y.

Copper Hammers
Hungerford, U. T., Brass & Copper Co., 121 Worth St. N. Y.

Copper Nail Bands
American Steel & Wire Co., Chicago, Ill.

Copper Rivets and Burrs
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Copper Tacks and Nails
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Copper Wire, Bare and Insulated
American Steel & Wire Co., Chicago, Ill.

Cordage
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.

Cordage Machinery.
Hoover & Gamble Co., Miamisburg, O.

Core Ovens
Millet Core Oven Co., Brightwood, Mass.

Cork Screws and Cork Pullers
Erie Specialty Co., Erie, Pa.

Corn Hooks
Withington & Cooley Mfg. Co., Jackson, Mich.

Corn Huskers
Wilcox Mfg. Co., Aurora, Ill.

Corrugated Iron and Steel
Garry Iron & Steel Roofing Co., Cleveland, O.
McCullough Iron Co., Wilmington, Del.
Scaife, Wm. B. & Sons, Pittsburgh.

Corundum
National Abrasive Mfg. Co., Phila., Pa.

Cotter Pin Machines, Automatic
Shuster, F. B. Co., New Haven, Conn.

Cotton Ties
American Steel Hoop Co., Pittsburgh, Pa.

Counting Machines
Durant W. N Milwaukee Wis.

Couplings, Compression
Sennett, Geo. B. Co., Youngstown, O.

Cow Ties
Garland Chain Co., Rankin, Pa.
Oneida Community, Ltd., Niagara Falls,

Cranes
Brown Hoisting & Conveying Mch. Co., Cleveland, O.
Chisholm & Moore Mfg. Co., Cleveland,
Cleveland Crane & Car Co., Cleveland, O.
Niles Tool Works Co., 136-138 Liberty St. N. Y.
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger, Milwaukee, Wis.
Pneumatic Crane Co , Pittsburgh, Pa.
Reading Crane & Hoist Wks., Reading, Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
Speidel, J. G., Reading, Pa.

Crayon
Steward, D. M. Mfg. Co., Chattanooga, Tenn.

Crucibles
Dixon, Jos. Crucible Co., Jersey City, N. J.

Cupolas
Paxson, J. W. Co., Philadelphia, Pa.

Cupolas, Hot Blast
Byram & Co., Detroit, Mich.

Curry Combs
New York Stamping Co., Brooklyn, N.Y

Cutlery
Cattaraugus Cutlery Co., Little Valley, N. Y.
Chatillon, John & Sons, 85 to 89 Cliff St., N. Y.
Dame, Stoddard & Co., Boston.
Goodell Co., Antrim, N. H.
Kimball, C. J. Co., Bennington, N. H.
Smith & Hemenway Co , 296 Broadway, N. Y.
Wiebusch & Hilger, Ltd., 9 to 15 Murray St., N. Y.

Cutting Off Machines
Hurlbut Rogers Mach. Co., So. Sudbury, Mass.

Dampers
Williams, A. C., Ravenna, O.

Dashes and Fenders
McKinnon Dash Co., Buffalo, N. Y.

Diamond Tools
Dickinson, Thos. L., 45 Vesey St., N. Y.

Dies
Adriance Mach. Works, Brooklyn, N. Y.
American Hdw. Mfg. Co., Ottawa, Ill.
Bliss, E. W. Co., Brooklyn, N. Y.
Ferracute Mach. Co., Bridgeton, N. J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Mossberg, Frank Co., Attleboro, Mass.
Richard Mfg. Co., Bloomsburg, Pa.
Wilson & Smith, Worcester, Mass.

Door Bells.—*See Bells and Gongs.*

Door Checks and Springs
Bardsley, Jos., 147 151 Baxter St., N. Y.
Pullman Sash Balance Co., Rochester, N. Y.

Door Holders
Brohard Co., Phila., Pa.
Caldwell Mfg. Co., Rochester, N. Y.

Draught Springs
Burditt & Williams, Boston, Mass.

Draw Benches
Richard Mfg. Co., Bloomsburg, Pa.
Thompson, Hugh L., Waterbury, Ct.

Drill Grinders
Heald, L. S. & Son, Barre, Mass.
Sellers, Wm. & Co., Inc., Phila., Pa.
Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.
Wilmarth & Morman, Grand Rapids, Mich.

Drilling Machines
Barnes, B. F. Co., Rockford, Ill.
Barnes, W. F. & John Co., Rockford, Ill.
Baush Mch. Tool Co., Springfield, Mass
Bement, Miles & Co., Phila., Pa.
Bickford Drill & Tool Co., Cin., Ohio.
Bullard Machine Tool Co., Bridgeport, Ct.
Burnham, Geo. Co., Worcester, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Cincinnati Mch. Tool Co., Cincinnati, O.
Dallett, Thos. H. & Co., Philadelphia.
D'Amour & Littledale Mch. Co., 131 Worth St., N. Y.
Davis, W. F., Machine Co., Rochester, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Harrington, E. Son & Co., Phila., Pa.
Hill, Clarke & Co., Boston, Mass.
Hoefer Mfg. Co., Freeport, Ill.
Prentice Bros., Worcester, Mass.
Quint, A. D., Hartford, Conn.
Shuster, F. B Co., New Haven, Conn.
Sibley & Ware, So. Bend., Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Slate Dwight Machine Co., Hartford, Ct.
Stow Flexible Shaft Co., Phila., Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
York, S. M. Co., Cleveland, O.

Drilling Machines, Automatic
Gould & Eberhardt, Newark, N. J.

Drills, Pneumatic
Chicago Pneumatic Tool Co., Chicago, Ill.

Drop Forgings
Belden Machine Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn.
Chicago Drop Forging & Fdry. Co., Kensington, Ill.
Clapp, E. D. Mfg. Co., Auburn, N. Y.
Consolidated Railway Electric Lighting & Equipment Co., 100 Broadway, N. Y.
Eccles, Richard, Auburn, N. Y.
Indianapolis Drop Forge Co., Indianapolis, Ind.
Keystone Drop Forge Co., Philadelphia.
Kilborn & Bishop Co., New Haven, Conn.
R. I. Tool Co., Providence, R. I.
Scranton Forging Co., Scranton, Pa.
Seward, M. & Son Co., New Haven, Ct.
Springfield Drop Forging Co., Springfield, Mass.
Strieby & Foote Co., Newark, N. J.
Transue & Williams Co., Alliance, O.
Williams, J. H. & Co., Brooklyn, N. Y.
Wyman & Gordon, Worcester Mass.

Drop Hammers
Billings & Spencer Co., Hartford, Conn.
Williams, White & Co., Moline, Ill.

Drop Presses
Manville, E. J. Mch., Co., Waterbury, Ct.
Miner & Peck Mfg. Co., New Haven, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Vulcan Iron Works, Chicago, Ill.

Drilling Machines
Aurora Tool Works, Aurora, Ind.
Dreses, Mueller & Co., Cincinnati, O.

Dumb Waiters
Energy Mfg. Co., Philadelphia, Pa.
Speidel, J. G., Reading, Pa.
Storm Mfg. Co., Newark, N. J.
Variety Machine Co., Warsaw, N. Y.

Dump Cars
Atlas Bolt & Screw Co., Cleveland, O.

Dynamos
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

Eave Trough Hangers
Berger Bros. Co., Philadelphia, Pa.
Oatman Bros., Medina, O.

Edge Tools
Buck, Chas., Millbury, Mass.
Buck Bros., Millbury, Mass.
Ferro-Carbon Castings Co., Phila., Pa.
White, L. & I. J. Co., Buffalo, N. Y.

Egg Beaters
Lyon, Nelson, Albany, N. Y.
Standard Co., Boston, Mass.

Egg Opener
Hartigan, W. R., Collinsville, Ct.

Electric Bells and Supplies
Ostrander, W. R. & Co., 304 Fulton St.

Electric Controllers.
Electric Controller & Supply Co., Cleveland, O.

Electric Lighting and Power Apparatus
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.

Electrical Apparatus
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

Electrical Supplies
Mianus Electric Co., Mianus, Conn.

Electrotypes
St. Louis Electrotype Foundry, St. Louis, Mo.

Elevators. *Makers of*
Eastern Machinery Co., New Haven, Ct.
Link-Belt Engineering Co. Phila., Pa.
Energy Mfg. Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Ridgway, Craig & Son Co., Coatesville, Pa.
Speidel, J. G., Reading, Pa.
Variety Machine Co., Warsaw, N. Y.

Elevator Buckets
Clark, W. J. & Co., Salem, O.
Cleveland Elevator Bucket Co., Cleveland, O.

Elevator Enclosures and Cabs
Ludlow Saylor Wire Co., St. Louis, Mo.

Emery
Tanite Co., Stroudsburg, Pa.

Emery Wheels
American Emery Wheel Works, Providence, R. I.
Best, L., 45 Vesey St., N. Y.
Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.
Buffalo Emery Wheel Co , Buffalo, N. Y.
Diamond Mach. Co., Providence, R. I.
Nazel & Bassett, Phila., Pa.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Safety Emery Wheel Co., Springfield, O.
Springfield Mfg. Co., Bridgeport, Conn.
Star Corundum Wheel Co., Detroit.
Sterling Emery Wheel Co., Tiffin, O.
Tanite Co., Stroudsburg, Pa.
Vitrified Emery Wheel Co., Westfield, Mass.
Zacharias & Co., Asbury Park, N. J.

Emery Wheel Dresser
Chicago Screw Co., Chicago, Ill.
Dickinson, Thos. L., 45 Vesey St., N. Y.

Engineers and Contractors
Aiken, Henry, Pittsburgh, Pa.
Erikson, Edw. E., Pittsburg, Pa.
Filer & Stowell Co., Milwaukee, Wis.
Heyl & Patterson, Pittsburgh, Pa.
Huber, S. V. Co., Pittsburgh, Pa.
Kennedy, Julian, Pittsburgh, Pa.
Kennedy, Walter, Pittsburgh, Pa.
Lamond, David, Pittsburg, Pa.
Laughlin, Alex & Co., Pittsburgh, Pa.
McClure, G. W. Son & Co., Pittsburgh, Pa.
Miller Engineering Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Penna. Engineering Wks., New Castle, Penna.
Riter-Conley Mfg. Co. Pittsburgh, Pa.
Smythe, S. R. Co., Inc., Pittsburgh, Pa
Swindell, W. & Bros., Pittsburgh, Pa.
Thompson, Hugh L., Waterbury, Ct.
Wellman Seaver Engineering Co., Cleveland, O.

Engines
Gas.
Mietz, Aug., 128-138 Mott St., N. Y.
Northern Engineering Works, Detroit, Mich.
Woolley Fdry. & Mch. Works, Anderson, Ind.
Gasoline.
Charter Gas Engine Co., Sterling, Ill.
Weber Gas & Gasoline Engine Co., Kansas City, Mo.
Watkins, F. M., Cincinnati, O
Woolley Fdry. & Mch. Works, Anderson, Ind.
Kerosene.
Mietz, Aug., 128-138 Mott St., N. Y.
Steam.
Allis, E. P. Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Filer & Stowell Co., Milwaukee, Wis.
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.
Sennett, Geo. B. Co., Youngstown, O.
Southwark Fdry. & Mch. Co., Philadelphia, Pa.
Sturtevant, B. F. Co., Boston, Mass.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Wetherill, Robt. & Co., Chester, Pa.

Engines, Marine
Lake City Engineering Co., Erie, Pa.

Engines, Second Hand
Everson, B. M., Pittsburgh, Pa.

Engravers
Mugford, A., Hartford, Conn.

Expanding Mandrels
LeCount, Wm. G., So. Norwalk, Conn.

Expansion Bolts
Church, Isaac, Toledo, O.
McCabe Hanger Mfg. Co. 533-543 W. 23d St., N. Y.
Newhall, Henry B. Co., N. Y.
Seaman, D. C. & Co., Philadelphia, Pa.
Steward & Romaine Mfg. Co., Phila., Pa.

Farriers' Tools.
Heller Bros. & Co., Newark, N. J.

Faucets, Wooden
Boston & Lockport Block Co., Boston, Mass.
Sommer's, John, Son, Newark, N. J.

Feed Cutters
Silver Mfg. Co., Salem, O.

Feed Water Heaters and Purifiers
Harrison Safety Boiler Works, Philadelphia, Pa.
Kelly, B. F. & Son, 91 Liberty St., N. Y.
National Pipe Bending Co., New Haven.
Patterson, F. L., 196 Liberty St., N. Y.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Hartford, Ct.

Fencing, Iron and Wire
Adam, W. J., Joliet, Ill.
American Steel & Wire Co., Chicago, Ill.
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Dwiggins Wire Fence Co., Anderson, Ind.
Ellis & Halfenbarger, Indianapolis, Ind.
Frost Wire Fence Co., Cleveland, O.
Gilbert & Bennett Mfg. Co., 42 Cliff St.
Hartman Mfg. Co., 309 Broadway, N. Y.
Kilmer Wire Mfg. Co., Chicago, Ill.
Kokomo Fence Mch. Co., Kokomo, Ind
Ludlow Saylor Wire Co., St. Louis, Mo.
Ornamental Iron & Wire Co., Chattanooga, Tenn.
Rossman Woven Wire Fence Co., Rossman, N. Y.
Stewart Iron Works, Cincinnati, Ohio
Up-to-date Mfg. Co., Terre Haute, Ind.

Ferro-Chromium
Willson Aluminum Co., 99 Cedar Street, N. Y.

Files and Rasps
Manufacturers of
Arcade File Works, Anderson, Ind.
Barnett, G. & H. Co., 41 & 43 Richmond Phila.
Disston, Henry & Sons, Inc., Phila., Pa.
Heller Bros. Co., Newark, N. J.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.
Stokes Bros. Mfg. Co., Freehold, N. J.

Filters
Scaife, Wm. B. & Sons, Pittsburg, Pa.

Finished Castings
Franklin, H. H. Mfg. Co., Syracuse, N. Y.

SEE ALPHABETICAL INDEX, PAGES 135–138.

Fire Brick
Borgner, Cyrus, Philadelphia, Pa.
Gardner Bros., Cumberland, Md.
Haws, W. H. Fire Brick Co., Mt. Union.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Poinier & Lester, Toledo, O.
Presbrey Fire Brick Co., Taunton, Mass.
Staten Island Clay Co., Woodbridge.
Taylor's, Chas. Sons Co., Cincinnati.
Valentine, M. D. & Bro. Co., Woodbridge.

Fishing Tackle
Dame, Stoddard & Co., Boston, Mass.

Flexible Metallic Tubing
Harris, Samuel & Co., Chicago, Ill.

Flexible Shafting
Chicago Flexible Shaft Co., Chicago, Ill.
Stow Flexible Shaft Co., Phila., Pa.
Stow Mfg. Co., Binghamton, N. Y.

Flint and Emery Paper
Baeder, Adamson & Co., Phila. Pa.

Floor and Ceiling Plates
Codling Mfg. Co., Bristol, Conn.

Flue Cleaners
Jackson Flue Scraper Co., Jackson
Jarecki Mfg. Co., Erie, Pa.

Fly Killers
Bigelow, J. F., Worcester, Mass.
Montgomery, R. R. & Co., Decatur, Ill.

Foot Power Emery Wheels
Buffalo Emery Wheel Co., Buffalo, N.Y.

Foot Pumps.
Gleason-Peters Air Pump Co., Houston and Mercer Sts., N. Y.

Foot Rests
Star Heel Plate Co., Newark, N. J.

Forges, Portable, &c.
Bradley Co., Syracuse N. Y.
Champion Blower & Forge Co. Lancaster, Pa.
Fairbanks Co., 311 Broadway, N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel
Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.
Bethlehem Steel Co., S. Bethlehem, Pa.
Eastern Forge Co., Boston, Mass.
Frankford Steel Co., Phila., Pa.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Otis Steel Co., Ltd., Cleveland, Ohio.
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.
Titusville Forge Co., Titusville, Pa.
U. S. Projectile Co., Brooklyn, N. Y.
Vulcanus Forging Co., Cleveland, O.

Forks, Hay and Manure
Continental Tool Co., Frankfort, N. Y.
Iowa Farming Tool Co., Ft. Madison, Ia.
Withington & Cooley Mfg. Co., Jackson.

Foundry Facings
Obermayer, S. Co., Cincinnati, O.

Foundry Lamps
Forest City Fdy. & Mfg. Co., Cleveland.
Paxson, J. W. Co., Phila., Pa

Foundry Supplies
Gilmour, J., Bennett Building, N. Y.
Obermayer, S. Co., Cincinnati, Ohio.
Osborn Mfg. Co., Cleveland, O.
Paxson, J. W Co., Phila., Pa.
Poinier & Lester, Toledo, O.

Friction Clutches
Eastern Machinery Co., New Haven, Ct.

Furnaces, Foundry
Byram & Co., Detroit, Mich.

Furnaces, Oil, Gas and Coal
Rockwell Engineering Co., 26 Cortlandt St., N. Y.

Fuses
Ensign Bickford & Co., Simsbury, Ct.

Gages
Crosby Steam Gage & Valve Co., Boston.

Galvanized Ware
Keen & Hagerty Mfg. Co., Baltimore.

Galvanizing
Blackman & King, 801 Greenwich St., N. Y.
Empire Pipe Bending & Supply Co., Brooklyn, N. Y.

Galvanizing Process
U. S. Electro Galvanizing Co., 348 Broadway, N. Y.

Garden Rakes
Jenkins Iron & Tool Co., Howard, Pa.

Garden Tools
Withington & Cooley Mfg. Co., Jackson,

Gas Composimeter
Uehling, Steinbart & Co., Ltd. Carlstadt, N. J.

Gas Compressors
Norwalk Iron Works Co., So. Norwalk,

Gas Furnaces
Am. Gas Furnace Co., 23 John St., N. Y.
Chicago Flexible Shaft Co., Chicago, Ill.

Gaskets
Canfield, H. O., Bridgeport, Conn.

Gaskets, Iron
Smooth On Mfg. Co., Jersey City N. J.

Gas Producers
Duff Patents Co., Allegheny, Pa.
Smythe, S. R. Co., Inc., Pittsburgh, Pa.
Swindell, W. & Bro., Pittsburgh, Pa.

Gauges, Rolling Mill
Haines Gauge Co., Philadelphia, Pa.

Gears
Boston Gear Works, Boston, Mass.
Gresson, Geo. V. Co., Philadelphia, Pa.
Gleason Tool Co., Rochester, N. Y.
Morse, Williams & Co., Phila., Pa.
Nuttall, R. D. Co., Allegheny, Pa.
Poole, Robt. Son & Co., Baltimore, Md.

Gears, Rawhides
Horsburgh & Scott, Cleveland, Ohio.

Gear Cutters
Becker Brainard Milling Machine Co., Hyde Park, Mass.
Gould & Eberhardt, Newark, N. J.
Whiton, D. E. Mch. Co., New London,

Generators, Electric
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

Gimlets
Norton Mfg. Co. Chester, Conn.

Glass Cutters
Barrett, W. L., Bristol, Conn.
Bultman, F. H. & Co., Cleveland, O.
Monce, S. G., Unionville, Conn.
Smith & Hemenway Co., 296 Broadway, N. Y

Glass Cutting Boards
Lufkin Rule Co., Saginaw, Mich.

Glue
Baeder, Adamson & Co., Phila., Pa.

Golf Goods
Bridgeport Gun Implement Co., 312 Broadway, N. Y.

Grates, Rocking
Sennett, Geo. P. Co., Youngstown, O.

Grease, Axle
Snow Flake Axle Grease Co., Boston.

Grinding and Polishing Mchs.
American Emery Wheel Works, Providence, R. I.
Barnes, W. F. & John Co., Rockford, Ill.
Besly, Chas. H. & Co., Chicago, Ill
Brown & Sharpe Mfg. Co., Providence.
Cincinnati Milling Mach. Co., Cincinnati, O.
Diamond Mach. Co., Providence, R. I.
Landis Tool Co., Waynesboro, Pa.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Safety Emery Wheel Co., Springfield, O.
Springfield Mfg. Co., Bridgeport, Conn.
Star Corundum Wheel Co., Detroit, Mich.
Tanite Co., Stroudsburg, Pa.
Universal Mach. Co., Providence, R. I.
Wilmarth & Morman, Grand Rapids,

Grindstones
Cleveland Stone Co., Cleveland, O.
Velox Machine Works, Chicago, Ill.

Grubbing Machine
New Century Mfg. Co., 48 E. 8th St., N. Y.

Guns
Marlin Fire Arms Co., New Haven, Ct.
Remington Arms Co., 315 Broadway, New York

Gymnasium Apparatus
Narragansett Mch. Co., Providence, R.I

Hack Saws
Disston, Henry & Sons, Inc., Phila., Pa.
Goodell-Pratt Co., Greenfield, Mass.
Springfield Machine Screw Co., Springfield, Mass.
Starrett, L. S. Co., Athol, Mass.

Hack Saw Frames
Millers Falls Co., 28 Warren St., N. Y.

Hammer Mold
Field, C. H., Providence, R. I.

Hammers
Heller Bros. Co., Newark, N. J.
Logan & Strobridge Iron Co., New Brighton, Pa.

Hammers, Pneumatic
Chicago Pneumatic Tool Co., Chicago,

Hammocks
Palmer, I. E., Middletown, Conn.
Bickneil Hdw. Co., Janesville, Wis.

Hand Screws
Bliss, R. Mfg. Co., Pawtucket, R. I.

Handle Machinery
Defiance Machine Works, Defiance, O.

Hangers, Barn Door
Coleman Hardware Co., Chicago, Ill.

Hangers, Door
Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Cronk Hanger Co., Elmira, N. Y.
Lane Bros., Poughkeepsie, N. Y.
Lawrence Bros., Sterling, Ill.
Louden Machinery Co., Fairfield, Iowa.
McCabe Hanger Mfg. Co., 533-543 W. 22d Street, N. Y.
McKinney Mfg. Co. Allegheny, Pa.
Ney Mfg. Co., Canton, Ohio.
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.
Wilcox Mfg. Co., Aurora, Ill.

Hangers, Shafting
Ball Bearing Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.

Hardware Comm'n Merchants
Graham, Jno. H. & Co., 113 Chambers St., N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Hardware Manufacturers
Arcade Mfg. Co., Freeport, Ill.
Central Hardware Co., Phila.
Coleman Hardware Co., Chicago, Ill.
Logan & Strobridge Iron Co., New Brighton, Pa.
Millers Falls Co., 28 Warren St., N. Y.
Ney Mfg. Co. Canton, Ohio.
Nicol & Co., Chicago, Ill.
Parker, Chas., Co., Meriden, Conn.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.
Stanley Works, New Britain, Conn.
Union Mfg. Co., 103 Chambers St., N. Y.
Van Wagoner & Williams Hdw. Co., Cleveland, O.
Wrightsville Hdw. Co., Wrightsville, Pa

Hardware Mfrs.' Agents
Graham, John H. & Co., 113 Chambers St., N. Y.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Hardware Shelving
Warren, J. D. Mfg. Co., Chicago, Ill.

Hardware Specialties
Acme Shear Co., Bridgeport, Conn.
Berger Bros. Co., Philadelphia, Pa.
Enterprise Mfg. Co., of Pa., Phila., Pa.
Graham, John H. & Co., 113 Chambers St., N. Y.
Pleuger & Henger Mfg. Co., St. Louis,
Scranton & Co., The, New Haven, Ct.
Smith & Egge Mfg. Co., Bridgeport, Ct.
Smith & Hemenway Co., 296 Broadway, N. Y
Wilson & Smith, Worcester, Mass.

Harness Snaps
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.
Imperial Bit & Snap Co., Racine, Wis.

Hasps and Staples
McKinney Mfg. Co., Allegheny, Pa.

Hatchets
Jenkins Iron & Tool Co., Howard, Pa.

Hay Knives
Clark & Parsons Co., E. Wilton, Me.
Ney Mfg. Co., Canton, Ohio.

Hay Tools
Louden Machinery Co., Fairfield, Iowa.
Myers, F. E. & Bro., Ashland, O.
Ney Mfg. Co., Canton, O.

Heating and Ventilating Apparatus
American Blower Co., Detroit, Mich.
Bayley, Wm. & Sons Co., Milwaukee, Wis.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Perkins, B. F. & Son, Holyoke, Mass.
Sturtevant, B. F. Co., Boston, Mass.

Heel Plates
Star Heel Plate Co., Newark, N. J.

Hinges
Jenkins Iron & Tool Co., Howard, Pa.
Lawrence Bros., Sterling, Ill.
McKinney Mfg. Co., Allegheny, Pa.
Stanley Works, New Britain, Conn.
Tiebout, W. & J., 118 Chambers St., N.Y.

Hitching Posts
Hartman Mfg. Co., 309 Broadway, N. Y.

Hoes, Garden, Planters', &c.
Continental Tool Co., Frankfort, N. Y.
Iowa Farming Tool Co., Fort Madison,
Jenkins Iron & Tool Co., Howard, Pa.

Hoists, Air
Pedrick & Ayer Co., Philadelphia, Pa.
Ridgway, Craig & Son Co., Coatesville,

Hoists, Chain and Rope
Box, Alfred & Co., Philadelphia, Pa.
Eckstein, C. G., 249 Centre St., N. Y.
Fulton Iron & Engine Works, Detroit, Mich.
Harrington, E., Son & Co., Phila., Pa.
McCoy, Jos. F. & Co., 26 Warren St.
Reading Crane & Hoist Works, Reading, Pa.
Speidel, J. G., Reading, Pa.

Hoisting Machines
Eastern Machinery Co., New Haven, Ct.
Lidgerwood Mfg. Co., 96 Liberty St., N. Y.

Hollow Mill
Geometric Drill Co., Westville, Conn.

Hollow Ware
Avery Stamping Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
New York Stamping Co., Brooklyn, N.Y
Rogers, Jno. M. Boat-Gauge & Drill Works., Gloucester, City, N. J.

Horse Nails
Capewell Horse Nail Co., Hartford, Ct.
Mooney, W. M. & Co., Ausable Chasm, N. Y.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston,
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Horse and Mule Shoes
Burden Iron Co., Troy, N. Y.
Phœnix Horse Shoe Co., Poughkeepsie,
Rhode Island Perkins Horse Shoe Co., Providence, R. I.

Horseshoe Studs
Leonhart & Co., Berlin, Schoneberg, Germany.

Hose
Boston Belting Co., Boston, Mass.
Peerless Rubber Mfg Co. 16 Warren Street, New York.

Hose Couplings
Clark, W. J. & Co., Salem, Ohio.

Hose Coupling, Air
Pedrick & Ayer Co., Philadelphia, Pa.

Hose Washers
Canfield, H. O., Bridgeport, Conn.

House Furnishing Specialties
Williams, A. C. Ravenna, O.

Hydraulic Jacks
Dudgeon, Richard, 24 Columbia St., N.Y.
Henderer, A. L. Sons, Wilmington, Del.
Watson-Stillman Co., 204 E. 43d St., N.Y.

Hydraulic Machinery
Watson-Stillman Co., 204 E. 43 St., N. Y.

Hydraulic Presses
Cornell, J. B. & J. M., 26th St. and 11th Ave., N. Y.

Hydraulic Tools
Watson-Stillman Co., 204 E. 43d St., N.Y.
Wood, R. D. & Co., Phila., Pa.

Ice Breakers
Giles, C. A. & Co., Chicago.

Ice Cream Dishers
Seavey Mfg. Co., Boston, Mass.

Ice Cream Freezers
North Bros. Mfg. Co., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Ice Making Machinery
York Mfg. Co., York, Pa.

Ice Picks
Dodge Machine Screw Co., Boston, Mass
Erie Specialty Co., Erie, Pa.

Ice Shredders
Enterprise Mfg. Co., Philadelphia, Pa.
Erie Specialty Co., Erie, Pa.

Ice Tools
Gerlach, Peter & Co., Cleveland, O.
Williams, A. C., Ravenna, O.
Wood, Wm. T. & Co., Arlington, Mass.

Injectors
Jenkins Bros., New York.
Watson, N. A., Erie, Pa.

Insurance, Boiler
Hartford Steam Boiler Inspection and Insurance Co., Hartford, Conn.

Iron and Steel, Swedish
Harvey, Arthur C. Co., Boston, Mass.
Lilienberg, N., 150 Broadway, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Potts, Horace T. & Co. Phila., Pa.

Iron Commission Brokers
Cabeen & Co., Phila., Pa.
Cotton, Barclay W. & Co., Phila., Pa.
Cox, Justice, Jr. & Co., Ltd., Phila., Pa.
Etting, Edw. J., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Law, Ernest & Co., Phila., Pa.
Levis, Henry & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia
Mohr, J. J., 430 Walnut St., Philadelphia.
Thomas Theodore, Utica, N. Y.
Wister, L. & R. & Co., Phila., Pa.

Iron. *Manufacturers*
Newkirk, J. B. & Co., Philadelphia, Pa.
Republic Iron & Steel Co., Chicago, Ill.

Merchants.
Bole, Ross & Co., Pittsburgh, Pa
Cotton, Barclay W. & Co., Phila
Cunliffe, R. M., Phila., Pa.
Law, Ernest & Co., Phila., Pa.
McInnes, C. E. & Co., Phila., Pa.
Ogden & Wallace, 577-583 Greenwich St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Potts, Horace T. & Co., Phila., Pa.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 66 B'way, N. Y.
Wheeler, Mifflin & Co., Phila., Pa.
Wilson, E. H. & Co., Philadelphia.

Importers.
Wheelock-Lovejoy & Co., New York and Boston.

Iron, Galvanized Sheet—*See Sheets, Galvanized.*

Iron, Sheet—*See Sheets, Iron and Steel.*

Iron Ore
Nicoll, B. & Co., 59-61 Wall St., N. Y.
Pilling & Crane, Phila., Pa.
Pullman, J. Wesley, Phila., Pa.

Ironwork, Ornamental
Adam, W. J., Joliet, Ill.
Barnum, E. T., Detroit, Mich.
Ornamental Iron & Wire Co., Chattanooga, Tenn.
Van Dorn Iron Wks. Co., Cleveland, O.

Japanning
Warner Bros. Co., Bridgeport, Conn.

Job Lots, Hardware
Chicago House Wrecking Co., Chicago, Ill.

Joist Hanger
Van Dorn Iron Wks. Co., Cleveland, O.

Kegs
Bell, Edwin & Sons Co., Youngstown, O.

Keys, Machine
Morton Mfg. Co., Muskegon Heights, Mich.

Keys, Split and Riveted
Hollinger Fence Co., Greenville, O.

Knife and Tool Grinder
Union Mfg. Co., Buffalo, N. Y.

Knives
Kimball, C. J. Co., Bennington, N. H.

Labaratory Outfits
Eimer & Amend, New York.

Lamps
Miller, Edward & Co., Meriden, Ct.

Lasts and Last Stands
Kupferle, Jno. C., St. Louis, Mo.
Pleuger & Henger Mfg. Co., St. Louis, Mo.
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Lathe Dogs
LeCount, Wm. G., So. Norwolk, Conn.

Lathes
American Tool Works Co., Cincinnati, Ohio.
Barker-Chard Mch. Tool Co., Cincinnati, Ohio.
Barnes, B. F. & Co., Rockford, Ill.
Brown & Sharpe Mfg. Co., Providence, R. I.
Bullard Mach. Tool Co., Bridgeport, Ct.
Davis, W. P. Machine Co., Rochester, N. Y.
Draper Mch. Tool Co., Worcester, Mass.
Fish, H. C. Mch. Wrks., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H., Jr., & Co., Phila., Pa.
Jones & Lamson Mch. Co., Springfield, Vt.
Lodge & Shipley Mch. Tool Co., Cincinnati, O.
McCabe, J. J., 14 Dey St., N. Y.
New Haven Mfg. Co., New Haven, Ct.
Pond Machine Tool Co., Plainfield, N.J
Potter & Johnson Co., Pawtucket, R. I.
Pratt & Whitney Co., Hartford, Conn.
Prentice Bros., Worcester, Mass.
Seneca Falls Mfg. Co., Seneca Falls, N.Y.
Young, W. C. Mfg. Co., Worcester, Mass

Lathe Tools
Armstrong Bros. Tool Co., Chicago, Ill.

Lathing, Wire
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester Mass.

Lawn Mowers
Coldwell Lawn Mower Co., Newburgh, N. Y.
Crescent Brass & Iron Co., Detroit.
Fairbanks Co., 311 Broadway, N. Y.
Supplee Hardware Co., Phila., Pa.

Lawn Mower Sharpeners
Wilcox Mfg. Co., Aurora, Ill.
Zacharias & Co., Asbury Park, N. J.

Lawn Sprinklers
Crescent Brass & Iron Co., Detroit Mich.
Kupferle, Jno. C., St. Louis, Mo.
McGowan, John H. Co., Cincinnati, O.
Pleuger & Henger Mfg. Co., St. Louis, Mo.

SEE ALPHABETICAL INDEX, PAGES 135–136.

Lemon Squeezers
Hagen & Reid, Troy, N. Y.
Logan & Strowbridge Iron Co., New Brighton, Pa.
Williams, A. C., Ravenna, O.

Link Belting
Buhl Malleable Co., Detroit, Mich.

Lockers
Narragansett Mch. Co., Providence, R.I.

Locks and Knobs
Central Hardware Co., Phila., Pa.
Reading Hdw. Co., Reading, Pa.
U. S. Steel Lock Co., Clinton, Iowa.

Locomotives.
Everson, B. M., Pittsburgh, Pa.

Logging Tools
Gerlach, Peter & Co., Cleveland, Ohio.

Lubricants
Dixon, Jos., Crucible Co., Jersey City
Snow Flake Axle Grease Co., Boston.

Lumbering Tools
Morley Bros., Saginaw, Mich.

Lunch Boxes
Seavey Mfg. Co., Boston, Mass.

Machinery
Acme Machinery Co., Cleveland, Ohio.
Adck, Geo. E., 109 Liberty St., N. Y.
Ajax Mfg. Co., Cleveland, Ohio.
American Tool Wks. Co., Cincinnati, O.
Asher, A., 109 Liberty St., N. Y.
Baird, U. Machinery Co., Pittsburgh, Pa.
Barnes, W. F. & John Co. Rockford, Ill.
Baush Mch. Tool Co., Springfield, Mass.
Becker-Brainard Milling Mach. Co. Hyde Park, Mass.
Bliss E. W. Co., Brooklyn, N.Y.
Bowler, Geo. H., Cleveland, O.
Briggs, Marvin, 12 Broadway, N. Y
Brown & Sharpe Mfg. Co., Providence.
Bullard Mch. Tool Co., Bridgeport, Ct.
Carlin Machinery & Supply Co., Allegheny, Pa.
Carlin's Sons, Thos., Allegheny, Pa.
Chesley Machinery Co., Havemeyer Bldg., N. Y.
Cincinnati Milling Mach Co Cin. O.
Cincinnati Planer Co., Cincinnati Ohio.
Corneli, J. B. & J. M., 26th St. and 11th Ave., New York City.
Davis, W. P. Machine Co., Rochester, N. Y.
Dawson, A. L. & Co., Chicago, Ill
Detrick & Harvey Mch. Co., Baltimore, Md.
Diamond Drill & Mch. Co., Birdsboro, Pa.
Doan, J. B. & Co., Chicago, Ill.
Draper Mach. Tool Co. Worcester Mass.
Farrel F'dry & Mch. Co., Ansonia, Conn.
Ferracute Machine Co., Bridgeton, N. J.
Fish, H. C. Machine Works, Worcester, Mass.
Garvin Machine Co., Spring and Varick Sts. N. Y.
General Supply Co., 40 John St., N. Y.
Geometric Drill Co., Westville Conn.
Gray, Robt. J., 52 54 E. 132d St., N. Y.
Hannan & Finton, Springfield, Mass.
Hendey Machine Co., Torrington, Conn.
Hill, Henry F., Boston, Mass.
Hill, Clarke & Co., Boston, Mass.
Johnson, Israel H., Jr., & Co., Phila.
Johnson, Wm. C. & Sons Mch. Co., St. Louis, Mo.
Kaiser, A. V. & Co., Phila., Pa
Keagy & Lear Mch. Co., Coshocton, O
Kerrick, J. H., Minneapolis, Minn.
Lodge & Shipley Mch. Tool Co., Cin., O.
Lund, S. T., Boston, Mass.
McCabe, J. J., 14 Dey Street, N. Y.
McDowell Stocker & Co., Chicago.
Manning, Maxwell & Moore, 85-89 Liberty St., N. Y.
Manville, E. J. Mach. Co., Waterbury, Ct.
Marshall & Huschart Mchry. Co., Chicago, Ill.
Mossberg, Frank Co., Attleboro, Mass.
National Machinery Co., Tiffin, Ohio.
New Doty Mfg. Co., Janesville, Wis.
New Haven Mfg. Co., New Haven, Conn.
New York Machinery Depot, 178 Broadway, New York.
Niles Tool Works Co., 138 Liberty St., N. Y.
Nilson, A. H. Mch. Co., Bridgeport Ct.
Paradox Machinery Co., Chicago, Ill.
Pennsylvania Machinery Co., Phila., Pa.
Phila. Machine Tool Co., Phila., Pa.
Pittsburgh Mfg. Co. Pittsburgh, Pa.
Pond Machine Tool Co., Plainfield, N.J.
Poole, Robt. & Son Co., Baltimore, Md.
Potter & Johnston Co., Pawtucket, R. I.
Poulterer & Co., Phila, Pa.
Pratt & Whitney Co., Hartford. Conn.
Prentice Bros., Worcester, Mass.
Prentiss Tool & Supply Co., 115 Liberty St., N. Y.
Rainier & Williams, Chicago, Ill.
Reade, Wm. A. & Co., Cleveland, O.
Seyfert's Sons L. F., Philadelphia, Pa.
Sigourney Tool Co., Hartford, Conn.
Thomas & Lowe Machinery Co., Providence, R. I.
Toomey, Frank, Philadelphia, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury. Conn.
Wetherill Robert & Co. Chester Pa.
Windsor Machine Co., Windsor, Vt.
Wormer, C. C. Mchy. Co., Detroit, Mich
York, S. M. Co., Cleveland, O.

Machinery, Wood Working
Defiance Machine Wks., Defiance, O.
Fay, J. A. & Egan Co., Cincinnati, O.

Machinery Springs
Scott, Chas. Spring Co., Phila, Pa.

Machinery Builders
Chapman, J. B. & Co., Springfield, Mass.
U. S. Projectile Co., Brooklyn, N. Y.

Machine Knives
Loyd, John, 558-562 Water St., N. Y.

Machine Screws—*See Screws, Machine*

Machine Screw Work
Spencer Automatic Mch. Screw Co., Hartford, Conn.

Machine Tools—*See Machinery*

Machine Work
Nuttall, R. D. Co., Allegheny, Pa.

Machine Wrenches
Billings & Spencer Co., Hartford, Conn.

Machinists' Scales
Starrett, L. S. Co., Athol, Mass.

Machinists' Tools and Supplies
Billings & Spencer Co., Hartford, Conn.
General Supply Co., 40 John St., N. Y.
Harris, Samuel & Co., Chicago, Ill.
Keystone Mfg. Co., Buffalo, N. Y.
King, J. M. & Co., Waterford, N. Y.

Manganese Bronze
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Manufacturing Properties
Hillman, J. H. & Co., Pittsburgh, Pa.

Manufacturing Sites
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
Southern Railway Co., Washington, D. C.

Measuring Machines
Rogers, Jno. M. Boat, Gauge & Drill Wks., Gloucester City, N. J.

Meat Choppers
Enterprise Mfg. Co. of Pa., Phila., Pa.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Streeter, N. R. & Co., Rochester, N. Y.
Woodruff, O. D., Pottstown, Pa.

Metal Brokers
American Metal Co., 52 Broadway, N. Y.

Metal Factors
Stroud, E. H. & Co., Chicago, Ill.

Metals
Hendricks Bros., 49 Cliff St., N. Y.
Hofeller, Theo. & Co., Buffalo, N. Y.
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
Rutter, A. T., 256 Broadway, N. Y.
United Metals Selling Co., 11 Broadway, N. Y.

Metal Polish
Hoffman, Geo. W., Indianapolis, Ind.

Metal Spinning
Goodwin & Kintz Co., Winsted, Conn.

Milling Machines
Adams Co., Dubuque, Iowa.
Becker-Brainard Milling Machine Co., Hyde Park, Mass.
Brown & Sharpe Mfg. Co., Providence.
Carter & Hakes Mach. Co., Winsted, Ct.
Cincinnati Milling Mach. Co., Cin., O.
Fox Machine Co., Grand Rapids, Mich.
Garvin Machine Co., Spring and Varick Sts., N. Y.
Niles Tool Works Co., 136-138 Liberty St., N. Y.
Shuster, F. B. Co., New Haven, Conn.
Thurston Mfg. Co., Providence, R. I.

Mincing Knives
Bishop, Geo. H. & Co., Cincinnati, O.
Palmer Hdw. Mfg. Co., Troy, N. Y.

Mining Machinery
Allis, E. P. Co., Milwaukee, Wis.
Rand Drill Co., 100 Broadway, N. Y.

Mining Screens
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton St., N. Y.
Michigan Wire Cloth Co., Detroit, Mich.

Miter Boxes
Thomson Bros. & Co., Lowell, Mass.

Molding Machines
Adams Co., Dubuque, Iowa.
Maywood Fdry. & Mch. Co., Chicago.

Motor Fans
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Motors, Air
Stow Flexible Shaft Co., Phila., Pa.

Motors, Electric
Eddy Electric Mfg. Co., Windsor, Conn.
General Electric Co., Schenectady, N. Y.
Sturtevant, B. F. Co., Boston Mass.
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

Nail Clippers
Cook, H. C. Co., Ansonia, Conn.

Nail Machinery
Crescent Mfg. Co., Belleville, Ill.
Pittsburgh Mfg Co., Pittsburgh, Pa.

Nail Pullers
Bridgeport Mfg. Co., Bridgeport, Conn.
Hagen & Reid, Troy, N. Y.
Scranton & Co., The, New Haven, Conn.
Snow L. T. New Haven, Conn.

Name Plates, Machinery
Livermore, Homer F., Boston, Mass.
Murdock Parlor Grate Co., Boston, Mass.

Natural Gas Pumps
Norwalk Iron Wks. Co., So. Norwalk, Ct.

Nickel Platers' Supplies
Eddy Electric Mfg. Co., Windsor, Conn.

Nickeloid
American Nickeloid Co., Peru, Ill.

Norway Shapes
Rowland, William & Harvey, Frankford, Philadelphia.

Nuts—*See Bolts*

Nuts, Self-Locking
National Elastic Nut Co., Milwaukee, Wis.

Nut Machines
Dunham Nut Co., Unionville, Conn.

Oil Burning Appliances
Rockwell, Engineering Co., 26 Cortlandt St., N. Y.

Oil Extractor
Reed & Curtis Mch. Screw Co., Worcester, Mass.

Oil Heaters—*See Oil Stoves.*

Oil Stones
Pike Mfg. Co., Pike Station, N. H.

Oil Stoves—*(See Stoves Oil, Vapor and Gasoline)*

Oilers
Gem Mfg. Co., Pittsburgh, Pa.
Hammer & Co., Branford, Conn.
Stoutenburg Mfg. Co., Keithsburg, Ill.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Oilless Bearings
North American Metalline Co., Long Island City, N. Y.

Ore Breakers
Aultman Co., Canton, O.
Cresson, Geo. V. Co., Phila., Pa

Ores
Blair, Reed F. Co., Pittsburgh, Pa.
Samuel, Frank, Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Ox Shoes
Scranton Forging Co., Scranton, Pa.
Woodruff, Walter W. & Sons, Mt. Carmel, Conn.

Packing
Boston Belting Co., Boston, Mass.
Morrison, Robert, St. Louis, Mo.
Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

Packing, Iron
Smooth On Mfg. Co., Jersey City, N. J.

Paints
Dixon, Jos. Crucible Co., Jersey City.

Pants Stretcher
Covert Mfg. Co., West Troy, N. Y.

Patent Solicitors
Goepel & Raegener, 290 Broadway, N. Y.
Hamlin, Geo. R., Washington, D. C.
Howson & Howson, Philadelphia and Washington.
Stocking, E. B., Washington, D. C.

Patterns
Norwalk Pattern & Mfg. Co., So. Norwalk, Conn

Perforated Metal
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

Phosphor Bronze
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.
Phosphor Bronze Smelting Co., Limited, Philadelphia.

Phosphor Tin
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Halk & Naumann, 518 Pearl St., N. Y.

Piano Plate Manufacturers
Randolph Iron Co., Brooklyn, N. Y.

Picture Wire
Ossawan Mills Co., Norwich, Conn.

Pig Casting Machines
Heyl & Patterson, Pittsburgh, Pa.

Pig Iron
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.
Ashland Steel Co., Ashland, Ky.
Baird, C. K. & Co., Phila, Pa.
Cherry Valley Iron Co., Pittsburgh, Pa
Dimmick, J. K. & Co., Phila., Pa.
Hickman, Williams & Co., Chicago, Ill.
Houston, C. B. & Co., Philadelphia, Pa.
Nicoll, B. & Co., 59-61 Wall St. N. Y.
Samuel, Frank, Philadelphia, Pa.
Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.
Snyder, W. P. & Co., Pittsburgh, Pa.
Superior Charcoal Iron Co., Grand Rapids, Mich.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Tidewater Steel Co., Philada., Pa
Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.

Pig Iron Analysis
Church, S. R., San Francisco, Cal.

Pig Iron Storage
Am. Pig Iron Storage Warrant Co., 4 Wall St. N. Y.

Pig Lead
Penna. Smelting Co., Pittsburgh, Pa

Pile Drivers
Vulcan Iron Works, Chicago, Ill.

Pipe, Bent
National Pipe Bending Co., New Haven, Conn.
National Tube Co., Pittsburgh, Pa.
Whitlock Coil Pipe Co., Hartford, Ct.

Pipe Coupling
Williams, J. H. & Co., Brooklyn, N. Y.

Pipe Cutting and Threading Machines
Armstrong Mfg. Co., Bridgeport, Conn.
Bignall & Keeler Mfg. Co., Edwardsville, Ill.
Curtis & Curtis, Bridgeport, Conn.
Jarecki Mfg. Co., Erie, Pa.
Merrill Mfg. Co., Toledo, O.
Saunders' Sons, D., Yonkers, N. Y.

Pipe Grips
Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c.
Jarecki Mfg. Co., Erie, Pa.
McNab & Harlin Mfg. Co., N. Y.

Pipe, Riveted Steel
Pollock, W. B. Co., Youngstown, O.
Scaife, Wm. B. & Sons, Pittsburgh.

Pipe Unions
Dart, E. M. Mfg. Co., Providence, R. I

Pipe, Water and Gas
Millar, C. & Son Co., Utica, N. Y.
National Tube Co., Pittsburgh, Pa.
Red Jacket Mfg. Co., Davenport, Iowa.
U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.
Warren City Boiler Works, Warren, O.
Wood, R. D. & Co., Philadelphia, Pa.

Piston Rods, Tobin Bronze
Ansonia Brass & Copper Co. 99 John St., N. Y.

Planes
Stanley Rule & Level Co., N. Y.

Planers
Amer. Tool Works Co., Cincinnati, O.
Baird, U. Machinery Co., Pittsburgh, Pa.
Cincinnati Planer Co., Cincinnati, O.
Detrick & Harvey Mch. Co., Baltimore.
Draper Mch. Tool Co., Worcester, Mass.
Pond Machine Tool Co., Plainfield, N.J.
Whitcomb Mfg. Co., Worcester, Mass.
Wilson, W. A., Rochester, N. Y.

Plated Ware
International Silver Co., Meriden, Ct.

Plates, Iron and Steel
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Singer, Nimick & Co., Inc., Pittsburgh, Pa.
Tidewater Steel Co., Philada., Pa
Wood, Alan Co., Philadelphia.

Plate Iron Work
Scaife, Wm. B. & Sons, Pittsburgh.

Pliers
Bridgeport Mfg. Co., Bridgeport, Conn.
Crane Hanger Co., Elmira, N. Y.
Utica Drop Forge & Tool Co., Utica, N. Y.

Pneumatic Tools
Chicago Pneumatic Tool Co., Chicago, Phila. Pneumatic Tool Co., Phila., Pa.

Pocket Knives
Cattaraugus Cutlery Co., Little Valley, N. Y.

Polishing Wheels
Divine Bros. Co. Utica, N. Y.

Portable Track
Atlas Bolt & Screw Co., Cleveland, O.

Poultry Fencing
DeKalb Fence Co., DeKalb, Ill.

Poultry Nettings
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Tyler, W. S. Co., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass

Power Hack Saws
Hoefer Mfg. Co., Freeport, Ill.

Power Hammers
Beaudry & Co., Boston, Mass.
Bradley Co., Syracuse, N. Y.
Dieneit & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Kidder, R. E., Worcester, Mass.
Miner & Peck Mfg. Co., New Haven, Ct.
Scranton & Co., The, New Haven, Conn.

Power Transmitting Mach'y
Cresson, Geo. V. Co., Phila., Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Norwalk Iron Wks. Co., So. Norwalk, Ct.

Pressed Metal Work
Avery Stamping Co., Cleveland, Ohio.

Presses, Power
Adriance Mach. Works, Brooklyn, N.Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Cross & Speirs Mch. Co., Waterbury, Ct.
Ferracute Mach. Co., Bridgeton, N. J.
Hibbard, W. H., Brooklyn, N. Y.
Hilles & Jones Co., Wilmington, Del.
Keagy & Lear Mch. Co., Coshocton, O.
Leffler, Chas. & Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.
Mossberg & Granville Mfg. Co., Providence, R. I.
Niagara Machine & Tool Wks., Buffalo.
Perkins Machine Co., Boston, Mass.
Phila. Machine Tool Co., Phila., Pa.
Rudolphi & Krummel, Chicago, Ill.
Shuster, F. B. Co. New Haven, Conn.

Projectiles
National Tube Co., Pittsburgh, Pa.

Pruning Shears
Cronk Hanger Co., Elmira, N. Y.

Pulleys
Amer. Pulley Co., Phila., Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Eastern Machinery Co., New Haven, Ct.
Evans, G. F., Boston, Mass.
Forster Pulley Works, Rochester, N.Y.
Hess Snyder & Co., Massillon, O.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Saginaw Mfg. Co., Saginaw, Mich.
Woods, T. B. Sons, Chambersburg, Pa.

Pumping Machinery
Cook, A. D., Lawrenceburg, Ind.
Filer & Stowell Co., Milwaukee, Wis.
Ingersoll-Sergeant Drill Co., 26 Cortlandt St., N. Y.
Lake City Engineering Co., Erie, Pa.
McGowan, J. H. & Co., Cincinnati, O.
Southwark Fdry. & Mch. Co., Philadelphia, Pa.

Pumps
Athol Pump Co., Athol, Mass.
Barnes Mfg. Co., Mansfield, O.
Deming Co., Salem, O.
Edson Mfg. Co., Boston, Mass.
Flint & Walling Co., Kendallville, Ind.
Hess, Snyder & Co., Massillon, O.
Humphryes Mfg. Co. Mansfield, O.
Myers, F. E. & Bro., Ashland, Ohio.
Red Jacket Mfg. Co., Davenport, Ia.
St. Joseph Pump & Mfg. Co., St. Joseph, Mo.
Wilder, S. & Co., Holliston, Mass.

Punches, Conductors'
Woodman, R. Mfg. & Supply Co., Boston, Mass.

Punches and Shears, Hand and Power
Bethlehem Foundry & Machine Co., So. Bethlehem, Pa.
Bicknell Hdw. Co., Janesville, Wis.
Bliss, E. W. Co., Brooklyn, N. Y.
Hilles & Jones Co., Wilmington, Del.
Mersick C. S. & Co., New Haven, Conn.
New Doty Mfg. Co., Janesville, Wis.
Williams, White & Co., Moline, Ill.

Punching and Shearing
Harrington & King Perforating Co., Chicago, Ill.

Push Carts
Syracuse Chilled Plow Co., Syracuse.

Pyrometers
Uehling, Steinbart & Co., Ltd., Carlstadt, N. J.

Railways, Industrial
Hunt, C. W. Co., West New Brighton, N. Y.

Rat and Mouse Traps
Burditt & Williams, Boston, Mass.

Ratchet Drills
Keystone Mfg. Co., Buffalo, N. Y.

Rawhide Gears
Nazel & Bassett, Philadelphia, Pa.

Razors
Buck Bros., Millbury, Mass.

SEE ALPHABETICAL INDEX, PAGES 135–136.

Razor Hones
Pike Mfg. Co., Pike Station, N. H.

Reamers
Morse Twist Drill & Mch. Co., New Bedford Mass

Recording Gauges
Bristol Co., Waterbury, Conn.
Uehling, Steinbart & Co., Ltd., Carlstadt, N. J.

Reels
Hendryx, A. B. Co., New Haven, Conn.

Refrigerating Machinery
York Mfg. Co., York, Pa.

Refrigerators
Maine Mfg. Co., Nashua, N. H.

Registers
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Relaying Rails
Donaldson & Newton, Phila., Pa.
Isaac Joseph Iron Co., Cincinnati, O.
May & Spalding, 32 Broadway, N. Y.
Steel Rail Supply Co., 100 B'way, N. Y.

Reloading Tools
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
Ideal Mfg. Co., New Haven, Conn.

Repairing Sets, Family
Mitchell, W. B. Chicago, Ill.
Schrayers, M. Sons & Co., Chicago, Ill.
Star Heel Plate Co., Newark, N. J.

Repair Outfits, Farmers'
Imperial Bit & Snap Co., Racine, Wis.

Revolution Counters
Pitkin, A. B. Machry. Co., Providence.
Tabor Mfg. Co., Elizabeth, N. J.

Revolvers
Harrington & Richardson Arms Co., Worcester, Mass.
Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.

Rheostats.
Electric Controller & Supply Co, Cleveland, O.

Rifles
Marlin Fire Arms Co., New Haven, Ct.
Remington Arms Co., 315 B'way, N. Y.
Stevens Arms & Tool Co., Chicopee Falls, Mass.

Ring Rollers
Shuster, F. B. Co., New Haven, Conn.

Riveters
Phila. Pneumatic Tool Co., Phila., Pa.

Riveters, Pneumatic
Chicago Pneumatic Tool Co., Chicago.

Rivets
American Iron & Steel Mfg. Co., Lebanon, Pa.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Burden Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
McInnes, C. E. & Co., Phila., Pa.
Plymouth Mills, Plymouth, Mass.
Rockford Bolt Works, Rockford, Ill.
Townsend C. C. & E. P., New Brighton Pa.

Riveting Machines
Bethlehem Foundry & Mch. Co., So. Bethlehem, Pa.
Shuster, F. B. Co., New Haven, Conn.

Rod Mill Machinery
Braddock Machine & Mfg. Co., Braddock Pa
Morgan Construction Co., Worcester, Mass.

Roll Turning Tools
Trethewey, Sam'l & Co., Ltd., Pittsburgh

Roller Bearings
Ball Bearing Co., Boston, Mass,
Mossberg & Granville Mfg. Co., Providence, R. I.

Rolling Mill Machinery
Booth, The Loyd Co., Youngstown, O.
Everson, B. M., Pittsburgh, Pa
Farrell Fdry. & Mch. Co., Ansonia, Ct.
Frank-Kneeland Mach. Co., Pittsburgh.
Garrison, A. Foundry Co., Pittsburgh.
Mesta Machine Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Mossberg & Granville Mfg. Co., Providence, R. I.
Penna. Engineering Wks., New Castle, Penna.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel
Booth, The Lloyd Co., Youngstown, O.
Farrel F'dry & Mach. Co., Ansonia, Ct.
Frank-Kneeland Mach. Co., Pittsburgh.
Garrison, A. Fdry. Co., Pittsburgh, Pa.
Lorain Foundry Co., Lorain, Ohio.
Mesta Machine Co., Pittsburgh, Pa.
Phila. Roll & Mch. Co., Philadelphia, Pa.
Seaman, Sleeth Co., Pittsburgh.
Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.
Youngstown Foundry & Machine Co., Youngstown, O.

Roofing and Siding
Asphalt Ready Roofing Co., 126 Water St., N. Y.
Garry Iron & Steel Roofing Co., Cleveland, O.
Scaife, Wm. B. & Sons, Pittsburgh
Youngstown Iron & Steel Roofing Co., Youngstown, O.

Rope and Cordage.
American Mfg. Co., 65 Wall St., N. Y.
Waterbury Rope Co., 69 South St., N. Y.

Rope and Web Goods
Covert Mfg. Co., West Troy, N. Y.

Rope Shield
Ironsides Co., Columbus, Ohio.

Rope Transmission and Hoisting
American Mfg. Co., 65 Wall St., N. Y.
California Wire Works, San Francisco, Cal.
Hunt, C. W. Co., West New Brighton, N. Y.
Leschen, A. & Sons, Rope Co., St Louis.
Woods T. B. Sons Chambersburg, Pa.

Rubber Goods
Boston Belting Co., Boston, Mass.
Canfield, H. O. Bridgeport, Conn.
Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

Rules
Lufkin Rule Co. Saginaw, Mich.
Stanley Rule & Level Co., 29 Chambers St., N. Y.

Sad Irons
Williams, A. C., Ravenna, O.

Sand Blast Apparatus
Ward, Edgar T. & Sons, Boston, Mass.

Sand Paper
Baeder, Adamson & Co., Phila, Pa.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Sash Balances
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co. Rochester, N. Y.
Streeter, N. R. & Co., Rochester, N. Y.

Sash Cords and Chains
Bridgeport Chain Co., Bridgeport, Conn.
Morton, Thos., 65 Elizabeth, N. Y.
Samson Cordage Works, Boston, Mass.
Silver Lake Co., Boston, Mass.
Smith & Egge Mfg. Co., Bridgeport.

Sash Locks
Fitch, W. & E. T. Co., The, New Haven, Conn.
Ives, H. B. & Co., New Haven, Conn.
Oefinger, J. L., Chicago, Ill.

Sash Pulleys
Fox Machine Co., Grand Rapids, Mich.
Grand Rapids Hardware Co., Grand Rapids, Mich
Palmer Hardware Mfg. Co., Troy, N. Y.

Sash Weights
Barney & Reed Mfg. Co., Boston, Mass.
Brown, E. E. & Co., Philadelphia, Pa.

Sausage Stuffers
National Specialty Mfg. Co., Phila., Pa.

Saws
Atkins, E. C. & Co., Indianapolis, Ind.
Bishop, Geo. H. & Co., Cincinnati, Ohio.
Disston, Henry & Sons, Inc., Phila, Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.

Saw Clamps
Disston, Henry & Sons, Inc., Phila., Pa.
Gunn & Hannah, Pittsburgh, Pa.

Saw Guides
Thomson Bros. & Co., Lowell, Mass.

Saw Handles
Ladd, W. C., Bristol, Conn.

Saw Sets
Disston, Henry & Sons, Inc., Phila., Pa.
Taintor Mfg. Co., 9 to 15 Murray, N. Y.

Saw Tools
Atkins, E. C. & Co., Indianapolis, Ind.

Scales
Chatillon, John & Sons, 85-89 Cliff, N. Y.
Chicago Scale Co., Chicago, Ill.
Pelouse Scale & Mfg. Co., Chicago, Ill.
Reading Hardware Co., Reading, Pa.
Standard Scale & Supply Co., Pittsburgh.

Scrap Metals
Armstrong, R. S. & Bro., Atlanta Ga.
Blake, M. J. & M., 10th Ave. and 15th St., N. Y.
Botjer, C., Hoboken, N. J.
Greiner, F., Philadelphia, Pa.
Hitner, H. A. & Sons, Phila., Pa.
Hofeller, Theo. & Co., Buffalo, N. Y.
Leonard, John & Co., 22 Broadway, N. Y.
Miles, E. O. & Co., Atlanta, Ga.
N. J. Iron & Metal Co., Paterson, N. J.
Perry, Wm. H. Co., Providence, R. I.
Phillips, F. R. & Sons Co., Phila., Pa.
Rogers, W. H., Bridgeport, Conn.
Samuels, M. Sons, Brooklyn, N. Y.
Smith Morton B. Co., New York.

Scrapers, Road
American Steel Scraper Co., Sidney, O.
Aultman Co., Canton, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Sidney Steel Scraper Co., Sidney, O.
Syracuse Chilled Plow Co., Syracuse,

Screen Hanger
Winter, R. G., Minneapolis, Minn.

Screens, Perforated Metal
Harrington & King Perforating Co., Chicago, Ill.

Screens, Window and Door
Daroy, Edw. & Sons, Philadelphia, Pa.

Screw Cutting Dies
Card, S. W. Mfg. Co., Mansfield, Mass.
Geometric Drill Co., Westville, Conn.
Rogers, Jno. M. Boat Gauge & Drill Wks., Gloucester City, N. J.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass
Winter Bros., Wrentham, Mass.

Screw Drivers
Brown, R. H. & Co., New Haven, Conn.
Goodell-Pratt Co., Greenfield, Mass.
Mayhew, H. H. Co., Shelburne Falls, Mass.
North Bros. Mfg. Co., Philadelphia, Pa.
Sawyer Tool Co., Fitchburg, Mass.
Union Mfg. Co., Buffalo, N. Y.

Screw Machinery
American Tool Wks Co., Cincinnati, O.
Brown & Sharpe Mfg. Co., Providence.
Draper Mach. Tool Co., Worcester, Mass.
Garvin Machine Co., Spring and Varick Sts., N. Y.
Jones & Lamson Mch. Co., Springfield, Vt.
Windsor Mch Co., Windsor, Vt.

Screws
Coach
Hall's Sam'l Sons, 229 West 10th St., N. Y.
Haskell, Wm H Mfg. Co., Pawtucket, R. I.
Machine
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Chicago Screw Co., Chicago, Ill.
Haskell, Wm. H. Mfg. Co., Pawtucket
Hubbell, Harvey, Bridgeport, Conn.
Illinois Screw Co., Chicago, Ill
Miles, P. S., 205 Quarry, Philadelphia.
Niagara Screw Co., Buffalo, N. Y.
Phila. Mach. Screw Works, Phila., Pa.
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.
Reed & Curtis Mch. Screw Co., Worcester, Mass.
Rhode Island Tool Co., Providence, R. I.
Worcester Mch. Screw Co., Worcester.
Wood
American Screw Co., Providence, R. I.
Franklin Moore Co., Winsted, Conn.
Reading Screw Co., Norristown, Pa.

Scroll Saws
Barnes, W. F. & John Co., Rockford, Ill.
Millers Falls Co., 28 Warren St., N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y

Scythe Stones and Whetstones
Cleveland Stone Co., Cleveland, O.
Pike Mfg. Co., Pike Station, N. H.

Seamless Steel Tubes
Ivins Ellwood, 487 Broadway N. Y.
Janney, Steinmetz & Co., Phila., Pa.
National Tube Co., Pittsburgh, Pa.

Sewing Machines
National Sewing Machine Co., Belvidere, Ill.

Shaft Coupling
Nicholson, W. H. & Co., Wilkes Barre, Pa

Shafting
American Steel & Wire Co., Chicago, Ill.
Cresson, Geo. V. Co., Philadelphia, Pa.
Dodge Mfg. Co., Mishawaka, Ind.
Fairmount Mch Co, Philadelphia, Pa.
Finished Steel Co., Youngstown, O.
Jones & Laughlins Co., Pittsburgh, Pa
Pardee & Works, Perth Amboy, N. J.
Pittsburgh Steel Shafting Co., Rankin, Pa.
Stow Mfg. Co., Binghamton, N. Y
Woods, T. B. Sons, Chambersburg, Pa.

Shaped Iron and Steel
Allentown Rolling Mill, Allentown, Pa.
American Steel Hoop Co., Pittsburgh, Pa
Forest City Steel & Iron Co., Cleveland, Ohio.
Lindsay, W. W. & Co., Phila., Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
National Steel Co., Bridgeport, O.
Passaic Rolling Mill Co., Paterson, N. J.
Phœnix Iron Co., Phila., Pa.
Pittsburgh Steel Shafting Co., Rankin, Pa.
Republic Iron & Steel Co., Chicago, Ill.

Shapers
Barker-Chard Mach. Tool Co, Cincinnati, O.
Gould & Eberhardt, Newark, N. J.
Perkins Machine Co., Boston, Mass.
Potter & Johnston Co., Pawtucket, R. I.

Shear Knives
Pittsburgh Shear, Knife & Machine Co, Pittsburgh, Pa.
Trethewey, Sam'l & Co., Ltd., Pittsburgh

Shears and Scissors
Acme Shear Co., Bridgeport, Conn.
Cattaraugus Cutlery Co., Little Valley, N. Y.
Heinisch's, R. Sons Co., Newark, N. J.
Lane Cutlery Works, Cedar Rapids, Ia.
National Cutlery Co., Phila., Pa.
Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

Shears, Metal
Carlin's, Thomas Sons Co., Allegheny, Pa.

Sheet Bars
National Steel Co., Battery Park Building, N. Y.

Sheet and Bolt Copper
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Sheet and Rolled Brass
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Sheet Metal Machinery
Adriance Mach. Works, Brooklyn, N. Y.

Sheets, Galvanized
American Sheet Steel Co, New York.
McCullough Iron Co., Wilmington, Del.

Sheets, Iron and Steel
American Sheet Steel Co., New York.
McCullough Iron Co., Wilmington, Del.
National Steel Co, Bridgeport, O.
Republic Iron & Steel Co., Chicago, Ill.
Singer, Nimick & Co., Inc., Pittsburgh.
Wister, L. & R. & Co., Philadelphia, Pa.
Alan Wood Co., Philadelphia.

Sheet Zinc
Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Boxes
Heller Box Co., Montclair, N. J.
Moore, C. P., Ravenswood, W. Va.

Shelf Ladders
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Milbradt, G. A. & Co., St. Louis, Mo.
Morley Bros., Saginaw, Mich.

Shelving
Warren, J. D. Mfg. Co., Chicago, Ill.

Shipbuilders
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.

Shovels, Spades and Scoops
St. Louis Shovel Co., St. Louis, Mo

Sinks
Kilbourne & Jacobs Mfg. Co., Columbus, O.

Skates, Ice
Dame, Stoddard & Co., Boston, Mass.
Union Hardware Co., Torrington, Conn

Skate Sharpeners
Osborn Mfg. Co., Cleveland, O.

Skylights
Drouve, G. Co., Bridgeport, Conn.

Smelting Works
Reeves, Paul S., 760 S. Broad, Phila.

Soapstone Goods
Pike Mfg Co, Pike Station, N. H.

Soapstone Pencils
Steward, D. M. Mfg. Co., Chattanooga, Tenn

Soldering Copper Handles
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Soldering Coppers
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Speaking Tubes
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialty Manufacturers
Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Smith & Egge Mfg. Co., Bridgeport, Ct.

Spelter
Illinois Zinc Co., Peru, Ill.
Matthiessen & Hegele Zinc Co., La Salle, Ill.
Penna. Smelting Co., Pittsburgh, Pa.

Spelter Solder
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

Spikes
American Iron & Steel Mfg. Co., Lebanon Pa

Spoons and Forks
International Silver Co., Meriden, Ct.

Sporting Goods
Dame, Stoddard & Co, Boston, Mass.

Spray Pumps—(*See Pumps*)

Springs
American Steel & Wire Co., Chicago, Ill
Barnes, Wallace Co., Bristol, Conn.
Cary Spring Works, 240 W. 29th St., N. Y
Chatillon, John & Sons, 85-89 Cliff St., New York.
Clark & Cowles, Plainville, Conn.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Sabin Machine Co., Montpelier, Vt.
Scott, Chas. Spring Co., Phila., Pa.
St. Johns Spring Co., St. Johns, Mich.
Welch, T. F. Mfg. Co., Boston, Mass.

Springs, Wagon, Etc.
Wurster, F. W. & Co., Brooklyn, N. Y.

Spring Cotters
Brooks, M. S. & Sons, Chester, Conn.
Hoosinger Fence Co., Greenville, O.

Spring Hinges
Bommer Bros., Brooklyn, N. Y
Chicago Spring Butt Co., Chicago, Ill.
Coleman Hdw. Co., Chicago, Ill.
Van Wagoner & Williams Hdw. Co., Cleveland, O.

Sprocket Chain
Buhl Malleable Co., Detroit, Mich.

Spruce Cutters, Foot and Power
Shuster, F. B Co., New Haven, Conn.

Stacks
Scaife, Wm. B. & Sons, Pittsburgh.

Stamped Ware
Jenkinson, R. C. & Co., Newark, N. J.
Keen & Hagerty, Mfg. Co., Baltimore.
New York Stamping Co., Brooklyn, N. Y

Stamping, Sheet Metal
American Hdw. Mfg. Co., Ottawa, Ills.
American Railway Supply Co., 24 Park Place, N. Y.
American Steel Scraper Co., Sidney, O.
Clay Stamping Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, Ohio.
Davis & Buxton Stamping Co., Worcester, Mass.
Goodwin & Kintz Co., Winsted, Conn.
Houghton & Buxton Mfg. Co., Worcester, Mass.
Jenkinson, R. C. & Co., Newark, N. J.
Konigslow, E. & Bro., Cleveland, Ohio.
Mossberg, Frank Co., Attleboro, Mass.
Reed & Curtis Mch. Screw Co., Worcester, Mass.
Wheeling Hinge Co., Wheeling, W. Va

Staple Machines, Automatic
Shuster, F. B. Co., New Haven, Conn.

Staples and Double Pointed Tacks
Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Titchener, E. H. & Co., Binghamton, N. Y.

Steam Hammers, &c.
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia St., N. Y.
Sellers, Wm. & Co., Inc., Phila., Pa.

Steam Heating
Webster, Warren & Co., Camden, N. J.

Steam Separators
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden.

Steam Shovels
Thew Automatic Shovel Co., Lorain, O.

Steam Specialties
Crosby Steam Gage & Valve Co., Boston.
Mason Regulator Co., Boston Mass.

Steel Balls
Cleveland Ball & Screw Co., Cleveland.

Steel Buildings
American Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
New England Structural Co., Boston, Mass
Riter-Conley Mfg. Co., Pittsburgh, Pa.
Scaife, Wm. B. & Sons, Pittsburgh, Pa.

Steel, Cold Rolled Strip
American Bicycle Mfg. Co., So. Chicago, Ill.
Wilmot & Hobbs Mfg. Co., Bridgeport.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel Forgings and Castings
Bethlehem Steel Co., So. Bethlehem, Pa

Steel Hoops
American Steel Hoop Co., Pittsburgh, Pa.

Steel Importers
Hobson, Houghton & Co., 98 John St. N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Wheelock, Lovejoy & Co., New York and Boston.

Steel (Mushet's Special
Jones, B. M. & Co., Boston.

Steel Manufacturers
Aliquippa Steel Co., Pittsburgh, Pa.
American Bicycle Mfg. Co., So. Chicago.
American Steel Hoop Co., Pittsburgh, Pa.
Ashland Steel Co., Ashland, Ky.
Boker, Hermann & Co., 108 Duane St., New York.
Bracburn Steel Co., Braeburn, Pa.
Champion Iron & Steel Co., Muskegon, Mich.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.

SEE ALPHABETICAL INDEX, PAGES 135–136.

Frankford Steel Co., Philadelphia.
Heckert-Baltzley Billet Co , Toledo, O.
Hobson, Houghton & Co., 98 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John St., New York.
Jones & Laughlins, Ltd., Pittsburgh, Pa.
Kidd Bros. & Burgher Steel Wire Co., McKee's Rocks, Pa.
La Belle Steel Co., Pittsburgh, Pa.
Lorain Steel Co., Lorain, Ohio.
Lukens Iron & Steel Co., Coatesville, Pa.
Nash, Geo. & Co., Chicago.
National Steel Co., Battery Park Building, N. Y.
Newkirk, J. B. & Co., Philadelphia, Pa.
Otis Steel Co., Ltd., Cleveland, Ohio.
Republic Iron & Steel Co., Chicago, Ill.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Inc., Pittsburgh.
Tidewater Steel Co., Phila., Pa.
Wardlow, S. & C., Sheffield, England.
Wilmot & Hobbs Mfg. Co., Bridgeport.
Manufacturers' Agents
Ogden & Wallace, 577-333 Greenwich St., New York.
Snyder, W. P. & Co., Pittsburgh, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.

Steel, Self Hardening
Denman & Davis, 85-87 John St., N. Y.

Steel Rails
Lorain Steel Co., Lorain, Ohio.

Steel Stamps and Stencil Dies
Eucker, L. A. Stamp Wks., Little Ferry, N. J.
Ness, Geo. M., Jr., 61 Fulton St., N. Y.
Schwerdtle & Siebert, Bridgeport, Conn.

Steel, Tool
Braeburn Steel Co., Braeburn, Pa.
Crescent Steel Co , Pittsburgh, Pa.
Denman & Davis, 85-87 John St., N. Y.
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John St., N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
Nash, Geo. & Co., Chicago.
Singer, Nimick & Co., Pittsburgh, Pa.

Step Ladders, Rolling
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Milbradt, G. A. & Co., St. Louis, Mo.
Morley Bros., Saginaw, Mich.

Stocks and Dies
Armstrong Mfg. Co., Bridgeport, Conn.
Card, S. W. Mfg. Co., Mansfield, Mass.
Curtis & Curtis, Bridgeport, Conn.
Fairbanks Co., 311 Broadway, N. Y.
Hollands Mfg. Co., Erie, Pa.
Jones & Lamson Mch. Co., Springfield, Vt.
Jarecki Mfg. Co., Erie, Pa.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield.
Winter Bros., Wrentham, Mass.

Stone Cutting Machinery
Gilmour, J., Bennett Bld'g, N. Y.

Stone Working Machinery
Patch, F. R. Mfg. Co., Rutland, Vt.

Stop Screws
Read, A. P. & Co., Chicago, Ill.

Store Fixtures
Warren, J. M. Mfg. Co., Chicago, Ill.

Storm Sash Hanger
Winter, R. G., Minneapolis, Minn.

Stove Linings
Ostrander Fire Brick Co. Troy, N. Y.

Stove Pipe Thimbles
Cheney, S. & Son, Manlius N. Y.

Stoves, Oil, Vapor and Gasoline
Schneider & Trenkamp Co., Cleveland Ohio.

Straightening Machines, Wire and Sheet Metal
Shuster, F. B. Co., New Haven, Conn.

Structural Iron and Steel Work
American Bridge Co., East Berlin, Ct.
Boston Bridge Works, Boston, Mass.
Eastern Bridge & Structural Co., Worcester, Mass.
Forest City Steel & Iron Co., Cleveland, Ohio.
Illinois Steel Co., Chicago, Ill.
Moseley Iron Bridge & Roof Co., 39 Cortlandt St., N. Y.
New England Structural Co., Boston, Mass.
Phoenix Iron Co., Philadelphia, Pa.
Riter-Conley Mfg Co., Pittsburgh, Pa.
Stewart Iron Works, Cincinnati, Ohio.
West Side Foundry Co., Troy, N. Y.

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Matthiessen & Hegeler Zinc Co., La Salle, Ill.

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Excelsior Needle Co., Torrington, Ct.

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International Silver Co., Meriden, Ct.

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Grand Crossing Tack Co., Grand Crossing, Ill.
Milwaukee Tack Co., Milwaukee, Wis.
Plymouth Mills, Plymouth, Mass.
Ripley & Bartlett, Plymouth, Mass.
Shelton Co., Birmingham, Conn.

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Kimball Bros. & Sprague, Brockton.
Perkins, Henry, Bridgewater, Mass.
Sweetzer, W. A., Brockton, Mass.

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Scaife, Wm. B. & Sons, Pittsburgh.

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Simplex Time Recorder Co., Gardner, Mass.
Waggoner Watchman Clock Co., Grand Rapids, Mich.

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Standard Tool Co., Cleveland, O

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Wire Fences—(*See Fencing, Iron and Wire.*)

Wire Goods
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Townsend, C. C. & E. P., New Brighton.

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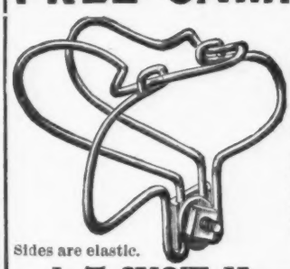
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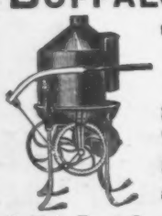
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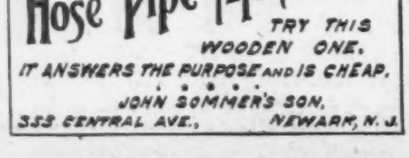
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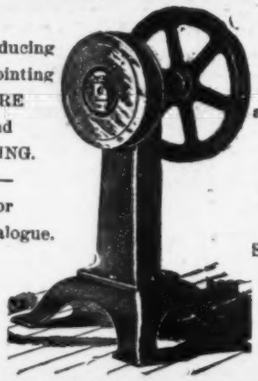
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